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BRIEFLY TOLD.

REPORT OF THE LIBRARY COMMITTEE, WESTERN GAS ASSOCIATION.—Our current instalment of the official report of the proceedings of the Indianapolis meeting of the Western Gas Association is a more than ordinarily interesting budget. And not the least important division thereof is the report from the Library Committee as presented and read by its Chairman, Mr. Frederic H. Shelton. His words show the great amount of work that the trust and its carrying out involved, and we wish that the presentation of the situation ended there; but it doesn't. Referring to the use of the contents of the Library by the members, Mr. Shelton was constrained to say that the Committee was "disappointed in its small use by the members, and is somewhat at a loss to account for it. During the year scacely half a dozen books have been called for." A bit further on, in attempting to name a reason for such neglect, it looks to us that the Committee, amongst the possible reasons named, puts out a very potent one in the remark that it "has not been sufficiently advertised." That defect, however, can be very easily remedied, and the JOURNAL stands ready to co-operate with the Association and the Committee in any way or method they may suggest to cure this ill. Perhaps it is not for us to take the initiative in the way of suggestion, but in any event we are willing to either lead or follow. We hope that the Committee's thoughts in respect of the Card Index, both as to its free use and regarding liberal subscriptions in the matter of maintaining its present and extending its future scope will be quickly and practically acted upon. The Committee has done much work of the most excellent sort.

NOTES.—

IN the exigencies of trade, which in the downtown district especially in these days require the tearing down of old-time structures to be replaced by those of up-to-date construction and sort, business people are oftentimes obliged to change their headquarters. This fate came to Captain W. H. White last year, when he removed his sign and shingle from 32 Pine street to 62 Wall street, and again did it come to him this year; for before us lies a communication to the following effect: "Please take notice that after to-day (the 11th inst.) I will remove my offices to No. 44 Broad street, Edison Building, where I will be pleased to receive my clients as friends. Mr. Arthur E. Boardman and Mr. J. A. Mayers will occupy part of my suite of offices." May good luck attend them all in their new quarters.

IT is said that the projectors of the Peoples Gas Company, Easton, Pa., are earnest in their purpose to construct and operate an opposition gas works at that point. In fact, it is announced that a site has been purchased and that the Company is in the market for bids for plant, etc. The incorporators of the concern are S. B. Brush, E. W. Evans, H. G. Siegfried, John S. Osterstock, M. Hale Jones and John S. Freeman. All of the parties are residents of Easton save the last named. He is a Philadelphian.

A CORRESPONDENT in San Francisco, Cal., forwards the following which recounts, from his own speech, the reason why Claus Spreckels engaged in the gas business in San Francisco—a great many believe he is now sorry he ever took a hand therein: Prominent German-Ameri-

LIBRARY OF CONGRESS JUN 15 1903 SMITHSONIAN DEPOSIT.

cans of San Francisco, recently gave a banquet at the Palace Hotel to the visiting scientific agriculturists from Germany who are making a tour of the United States studying its farming methods and allied branches. Charles Bundschu acted as toastmaster, and after the menu there were a number of addresses. One of the speakers was Claus Spreckels, and he was given close attention as in a conversational way he spoke about some of his own business experiences. "A number of years ago," said Mr. Spreckels, "the sugar trust sought to force me to place my sugar business on this Coast in its combination. I refused to be dictated to by it. In the fight that followed, I invaded the trust's own territory at the East. Well, we had a fight and I licked the trust in good fashion. I thought to retire and take a well-earned rest a couple of years ago. Let me tell you why I am still in harness. I put up a new building in this city and a smoke nuisance near by was a source of bother to the people in the building. The smoke came from a gas and electric company's plant. A Mr. Joseph Crockett was President. I wanted him to try and do something to abolish the nuisance. He took no notice of my complaint. One day in the Club I said to him: 'What about that smoke, Joe?' 'This is no place to talk business,' was his snappish reply. 'Either his boots were too big for him or he for his boots. I determined to go into the gas and electric business myself and, gentlemen, I am in it good and big and think I'm going to have a pretty big say in that particular line of business in this town.'"

THE Western Gas Construction Company, of Fort Wayne, Ind., has just closed a contract, covering one 5-foot 6-inch set of its latest design, double-superheater water gas apparatus. The contract also includes the furnishing of iron floors, steel roof, etc., and it was awarded by the owners of the Logansport and Wabash Valley Gas Company, for erection in Logansport.

THE second annual report of the Montreal (Can.) Light, Heat and Power Company, recently published, shows that the gross earnings of the Company for the past twelvemonth amounted to $1,937,560, and the net profits to $718,667. Out of the profits there have been declared four quarterly dividends of 1 per cent. each, amounting to $679,354, leaving a balance of $39,333, which has been placed to the credit of the surplus account. The dividends paid show an increase over last year of $91,365, and, in addition, there was an increase in the interest on bonds and loans of $90,709. The Company is now supplying all the gas and electricity used in the city of Montreal and surrounding suburbs, and the Directors expect that the Company will realize a considerable benefit from the economical operation of all the several Companies, which comprise the Montreal Company, under one management. Owing to the break in the Chambly dam the Company suffered a loss in revenue, and an increased operating expense, estimated at $153,351 net earnings. During the year 17,806 incandescent lamps and motors, equivalent to 5,093-horse power, were added to the circuits. At the meeting of the Directors, Mr. H. S. Holt was re-elected President, Hon. R. Forget, Vice-President, and H. H Henshaw, Secretary-Treasurer.

MR. F. DE V. THOMPSON, General Manager of the Springfield (Mass.) Gas Light Company, has returned from a trip abroad, mainly taken up in the inspection of European gas plants.

A MEETING of the shareholders in the Sharpsburg and Etna (Pa.) Gas Company was held recently with a view of reorganizing it. Its plant was sold under foreclosure proceedings by a receiver, some time ago, and has been idle for a long time because the residents of the two boroughs used natural gas instead of artificial gas. The interests which bought the plant were composed mostly of creditors, and they are now organizing simply to hold the charter and franchises of the Company.

THE authorities of Youngstown, O., have arranged for a protracted celebration of the Fourth of July holiday this year. Prominent in the showing will be night illuminations of a profuse order. The Youngstown Consolidated Gas and Electric Company will furnish the needed gas and electric currents on this public illumination account free of charge.

THE Public Service Corporation of New Jersey, in its management of its affairs in Paterson and Passaic, has designated the institution there as Gas and Electric Department, Paterson and Passaic Division, Public Service Corporation. The former staff of officers is retained, headed by Colonel William H. Rogers, under the title of General Agent. Mr. W. L. Williams is Engineer of the Gas Department, and Mr. A. D. Whittemore is Superintendent of Works and Distribution. The Superintendent of the Electric Department is Mr. W. M. Brock.

[OFFICIAL REPORT.—REVISED BY THE SECRETARY.—Continued from Page 889.]

TWENTY-SIXTH ANNUAL MEETING, WESTERN GAS ASSOCIATION.

HELD AT INDIANAPOLIS, IND., IN THE CLAYPOOL HOTEL, MAY 20, 21 AND 22, 1903.

FIRST DAY—MORNING SESSION.

The President introduced Mr. John Somerville, of Indianapolis, who read the following paper on the

MAXIMUM ECONOMICAL YIELD OF GAS PER POUND OF COAL CARBONIZED.

Your Committee have done me the honor to ask me to start the discussion on what is the "Maximum Economical Yield Per Pound of Coal Carbonized." There can be no question that there is a maximum useful yield; a point where the cost of producing the gas is more than the value of the gas produced. I doubt if it is possible, owing to varying conditions, to say where that point is; some coals requiring for their proper distillation a higher or lower temperature than others.

Then, there is the question of candle power, the standard of which varies in different localities. The variations, therefore, will not permit us to lay down any hard and fast line as to the proper degree of heat that will produce the best results, so that to some extent the question is one of locality. Yet, although these varying conditions exist, the question still presents itself, "How far is it profitable to force the distillation of the coal we are using?" Speaking from personal experience extending over a number of years, I have found it profitable to limit my yield from the coal I use (so-called "second pool" Youghiogheny) to 4.70 and 4.75 cubic feet per pound. This yield will give about 17 candles, varying somewhat with the state of the outside temperature, and requiring from 5 to 7 per cent. of cannel to bring the candle power to the required standard of 18. Desiring, as all of us do, to increase the yield, and thereby to effect a saving in the coal, I have at different times increased the heats until the make rose from 4.75 to 5 feet per pound. Taking the cost of the coal at $3 per ton, this extra 500 feet gained effected an apparent saving of 15 cents per ton of coal carbonized, and on the year's supply of say 23,000 tons, amounted to the respectable sum of $3,450. If this increase of yield could be shown to be clear gain then you will agree with me that such a saving is a consummation devoutly to be wished. But I have found from repeated experiments in this direction that the extra 500 feet was not a clear gain by any means; and in fact it seemed doubtful if there was any gain whatever. It will be understood, as I have already intimated, that the saving is not in the increased yield of gas, but in the less amount of coal required to make the gas, which, in this case, is 100 pounds, and at $3 per ton, equals 15 cents. We will now inquire if this 15 cents per ton is really saved, or not. As an offset against it we have: First, a less amount of coke produced, equal to the weight of 500 feet of gas; say 17 pounds. The coke being worth $3 per ton, this 17 pounds is worth 2½ cents. Second, I found that the extra fuel required for a yield of 5 feet per pound amounted to 1 bushel of coke per ton of coal carbonized, or about 10 per cent., which amounts to 6 cents. Third, some time ago, in making a new contract for our tar, a buyer asked me if I carried high heats? I replied that I aimed to take out of the coal all of what I termed commercial gas; that my yield was about 13 gallons per ton. In that case, he said, I can afford to give you half a cent more per gallon than from the tar made from high heats, and he did so. I found, when getting 5 feet to the pound, that the tar deteriorated both in quantity and quality, dropping from 13 gallons to 11½. I am, therefore, I think justified in deducting from its value this half cent., which is equal to 6½ cents, and for the less quantity produced, 1½ gallons, which, at 4 cents per gallon, equals 6 cents. I found no difference in the quantity or quality of the ammoniacal liquor; but the candle power dropped from 17 to 16½ candles. There is the weight here of 1½ gallons of tar amounting to 15 pounds, which I find some difficulty in accounting for, as the tar is supposed to be made in the hydraulic main. We must assume, I think, that with moderate heats certain heavy hydrocarbons find their way into the hydraulic main unimpaired; but with high heats these hydrocarbons are converted into free carbon, part of which adheres to the sides of the standpipes and the remainder is deposited in the hydraulic main. To sum up, then, we have as against the saving of 15 cents per ton of coal carbonized:

Less coke made	2½ cents
Increase in fuel	6 "
Less value of tar	6½ "
Less quantity of tar	6 "
	21 cents

With modern regenerative furnaces the percentage of fuel will be, say, 2 cents less than the figure I give, and there will be a saving in labor when making 5 feet to the pound, as there will be less coal to be handled and fewer retorts in use. Perhaps this point will be more clearly shown if we should produce the cost sheet of the manufacturer of 1,000,000 cubic feet as follows:

Cost of carbonizing 105.26 tons of coal, making 9,500 cubic feet per ton: Coal costing $3 per ton; coke made, 1,240 pounds per ton, costing $3 per ton; 30 per cent. of coke used under the retorts; 13 gallons of tar per ton, at 4 cents:

Coal—105.26 tons	$315.78	31.6 cents per 1,000 cubic feet
Labor	120.00	12.0 " " " " "
Fuel—19.6 tons	58.80	5.9 " " " " "
	$494.58	30.3 " " " " "
Deduct residuals	191.82	19.2 " " " " "
	$302.76	49.5 " " " " "

Residuals.

Coke—45.7 tons at $3	$137.10
Tar—1,368 gallons at 4 cents	54.72
	$191.82

Cost of carbonizing 100 tons of coal, making 10,000 cubic feet per ton: Coal, costing $3 per ton; coke made 1,223 pounds per ton, costing $3 per ton; 40 per cent. of the coke used under the retorts; 11½ gallons of tar made per ton, at 3½ cents:

Coal—100 tons	$300.00	30.0 cents per 1,000 cubic feet
Labor	114.00	11.4 " " " " "
Fuel—24.46 tons	73.38	7.3 " " " " "
	$487.38	48.7 " " " " "
Deduct residuals	150.32	15.0 " " " " "
	$337.06	33.7 " " " " "

Residuals.

Coke—36.69 tons at $3	$110.07
Tar—1,150 gallons at 3½ cents	40.25
	$150.32

The result appears to be about the same as my former figures, and, if they are correct, would indicate that the maximum economical yield does not lie in the direction of high heats. There are certain disagreeable and expensive incidents invariably accompanied with the running of high heats. As I have already intimated, 15 pounds of tar per ton of coal carbonized are converted into free carbon. This carbon eventually chokes up the standpipes, and these stoppages generally occur when the make of gas is greatest, thereby causing a loss of gas, heat and time. The wear and tear of the benches is increased. The radiation of heat from the setting is also increased. In this connection I desire to call your attention to the valuable paper, read before the International Gas Congress, in Paris, by M. Euchene, on the "Thermic Reactions in the Distillation of Coal." Primarily, high heats are the cause of naphthaline stoppages in the works and street mains. I am aware that with moderate heats naphthaline can also be produced in mischievous quantities, but this is always caused by the subsequent maltreatment of the gas. In increasing the yield from 4.75 to 5 feet per pound, the illuminating power is reduced about 1 candle, thereby necessitating the use of an extra amount of cannel or other enricher to bring the gas to the required candle power, the expense of which has to be charged to the extra gas made. In conclusion, it is well to remember that as there is a maximum economical limit to the speed of a dynamo, railroad train and steamship, so there is also to the yield of gas from a ton of coal. I mention these truisms because I find it has become the fashion to speak of a ton of coal of 2,000 pounds yielding 10,000 cubic feet of gas, without any qualifications. Even some gas managers indulge in this exuberant sort of talk, thereby conveying a very erroneous impression of the cost of making gas to the minds of the municipalities and others with whom we have dealings.

Discussion.

The President—Gentlemen, Mr. Somerville's paper is a very interesting one, and I doubt not it will open up a good discussion. We would be pleased to hear from some of the members on the subject, especially from Mr. John McIlhenny.

Mr. McIlhenny—I have listened with great interest to Mr. Somerville's paper. I have knowledge of quite a large company that experimented for two years, the first year with high heats and the second with low ones. The first year it produced 5 feet and over per pound, from Penn, Westmoreland and West Virginia coals. The next year like coals were used, but the production was only from 4.70 to 4.75 per pound. Without going into the particulars of the case, the result was greatly to the advantage of the low heats. There was greater comfort in the retort house, less work in keeping up the heats in the second year; the material lasted longer—that is, the retorts and brickwork showed less wear and tear. The best part of it all was, at the end of the year they had made more money than during the first year. I think that this is the best test we can give to any experiments.

The President—Mr. Gimper may be able to add a fact to the discussion.

Mr. Gimper—I don't know that I can say very much on the subject, because we have been making water gas only for over a year; but I may speak of what I have done in the past. Mr. Somerville rightly says it is a question of locality. In our own case I have aimed to make 5 feet to the pound of coal carbonized, and we were not restricted to 18-candle gas. Still I have succeeded in making 17 to 17½-candle gas. Our coal is very expensive and coke very cheap. We have used Westmoreland coal, also Kanawha, West Virginia. We have full-depth regenerative benches of the Bredel pattern, and I would like to know at this point what sort of firing Mr. Somerville used?

Mr. Somerville—Open fire, natural draft.

Mr. Gimper—I think Mr. Somerville would find it difficult to get a 5-foot yield with that kind of bench. The difference of heats between 4.75 and 5 feet yields is not very much, so that one heat would produce as much naphthaline as the other. As to the tar question. I had a like experience with that recited by Mr. Somerville, but I overcame the difficulty in this manner: After building our new benches and working 5-foot heats, the man who bought our tar asked, "What is the matter with it? I cannot saturate paper with it; it doesn't work like it used to." I knew our tar was thicker. It would not run to our tar cisterns and gave us and him trouble. So I separated the tar coming from the hydraulic main into tanks above ground, from which the filling of barrels could easily be done. The tar coming from the P. and A. and washers went into the old wells. This worked very well. Our tar customer was then glad to make a 5-year contract at the old price and renewed it again after expiration. In separating the tars I found nearly half the tar was the light, thin tar and the balance heavy. He bought all the tar, heavy and light. The heavy tar was used for making pitch for roofing and sanitary flooring.

Mr. Berkley—I would like to ask Mr. Gimper if these results are based on corrected temperatures?

Mr. Gimper—We take the temperature 8 times in 24 hours, and at the end of the month correct the yield to temperatures of 60°.

The President—Mr. Runner has had some satisfactory experience on this matter.

Mr. Runner—We are using full-depth benches and get a yield of 5 feet or over. We had an experience with our tar about the same as Mr. Gimper relates. The man who was taking the tar wanted to know what we were doing. We are letting the tar all go in together and are getting the same price for it as we did before, although there was some kicking. We get an average yield of a little more than 5 feet, and with our very low leakage account we sold 5 feet of gas for every pound of coal carbonized the past year. We have our naphthaline difficulties, but they are very easily overcome when you are fixed for them. With regard to candle power, we had only a jet photometer, which indicated about 17 candles. The washers and scrubbers we use retain the hydrocarbons instead of washing them out, and this we think accounts for the high candle power.

Mr. Hartman—I am an advocate of high heats. All of the progress in carbonizing methods seems to point to higher temperatures. There may be at present attendant difficulties in the form of lampblack and naphthaline, but undoubtedly these difficulties will be overcome. Carbonizing at high temperatures with our present form of retort, we necessarily have an excessive amount of lampblack and naphthaline formed from the hydrocarbons in the gas, by the thermo-chemical reactions in the upper part, or fixing chamber of the retort. The lampblack mixing with tar stops standpipes and hydraulic mains, and the tar made is inferior in quality. The naphthaline is the source of trouble by stopping up apparatus or pipes either in the works or in the distribution system. In some plants, to avoid this trouble, one condenser or other piece of apparatus is maintained at such a temperature that the naphthaline will be condensed and deposited thicker in its upper part,

or made of material less conductive of heat than in its lower part. Also, the use of hollow tile in bench arch construction to decrease radiation suggests making the upper part of the retort on the same plan. It seems reasonable to hope that by studying the thermo-chemical conditions in the retort, and altering them to meet the present requirements, we may carbonize coal at high temperatures and obtain a high yield of gas without a wasteful loss of hydrocarbons and without the attendent formation of naphthaline and lampblack therein. By cleaning out this piece of apparatus periodically and carting the naphthaline to the boiler room, they free themselves from trouble from this source in other parts of their system; but I believe that we do not realize what a wasteful process we are following when we allow valuable constituents of the gas to be converted into a substance so unstable that we must take it out of the gas with inconvenience and loss. In the retort we make a gas rich in hydrocarbons, but before it leaves the retort it is subjected to chemical changes which entirely alter its composition. It is now low in hydrocarbons and high in the percentage of hydrogen, and some of the benzene has been converted into naphthaline, while the carbon liberated by the decomposition of the hydrocarbons is in part deposited on the walls of the retort, and in part travels with the gas and tar as an exceedingly objectionable constituent. In the water gas process, if we make naphthaline and lampblack, we know that our fixing chamber or superheater is too hot and we lower its temperature. In the coal gas process we make lampblack and naphthaline because the coal gas fixing chamber, or upper part of the retort, is too hot; but for relief we cannot lower this temperature without lowering the temperature of the lower or generating part of our retort. The objectionable feature of the coal gas process with the present form of retort is that the gas passing along the upper wall of the retort is heated as much as or more than the coal lying on the bottom of the retort. To remedy this condition it seems necessary to modify our retort. It may be that the upper part of the retort should be less conductive of heat than the lower part. We have learned that carbon deposits on the walls of the retort obstruct the passage of heat. Following this idea, perhaps our retort should be greatly modified in construction.

Mr. Runner—We use no cannel coal at all. There is a tendency, of course, to stoppage of standpipes, but we have our men so well trained they give constant attention to this so we don't have stopped standpipes from one month's end to the other. Again, we sell our coke by measure and not by weight, consequently we are not in the same condition with those who sell by weight. We are not restricted to candle power by the city.

Mr. Mitchell—I will say I would stand for 5 feet per pound of coal. Our books show we make more money when we are making 5 feet than when we are making 4.70. We use for fuel slack coal which is not as costly as coke. We have, of course, trouble with stopped standpipes and bother in our hydraulic mains, but these difficulties can be overcome. We find there is more money in getting 5 feet than in getting a lower yield. Our retorts stand about 2 years and 3 months; sometimes 2 years and 6 months; 2 years and 6 months is very good life for a bench of retorts. With a yield of 5 feet we get a candle power of 16½, and with the use of Welsbach lights and a little increased pressure on our mains, we get very good service.

Mr. Murdock, being called on by the President, said he didn't know that he could say very much on the subject. He was working under very poor conditions at the present time, but thought 4.75 to 5 feet was a very good yield. He would like to ask what run was followed by some of the members.

Mr. Carroll Miller—Mr. President, referring to the figures that suggested 5 cubic feet yield, on top of page 45, the item of 12½ cents for coal I think should be stricken out. In my experience the difference as between 5 feet and 4.75, there is no less coke made, and this 500 feet of gas is more than accounted for in the tar which is decomposed. This tar Mr. Somerville says is 15 pounds. Now, when this is decomposed the hydrogen is given out, and 500 feet of hydrogen weigh only 2.65 pounds. And this increase of fuel, while it will be the same per ton, I think will figure less per 1,000. With reference to the lower value of the tar, I don't think that, when you make your analysis of your tar yon will find that the amount of free carbon will deteriorate half a cent.; in fact, I don't think it will deteriorate at all, because if you use any process for flushing out your mains and removing free carbon before it can settle and make your tar thick, that tar is just as good as ever, whether your heats are high or low, because your tar deteriorates from the lampblack which separates from the gas on top of your main, and afterwards settles and mixes with the tar, thus making it thick. The high percentage of free carbon is lampblack. I have made up a rough balance from this, taking his figures for a yield of 5 cubic feet. I have 100 tons of coal $300, or 30 cents per 1,000; labor, $114. This is in the same proportion per ton as that which Mr. Somerville has. That makes 11.4 cents per 1,000, and fuel, instead of 24.46 tons, 19.67, which is in proportion to the yield of gas. As I said, I do not think that the fuel per 1,000 will be as much with 5 cubic feet yield as with 4.75; it will not be as much, but I have taken it in proportion to the gas. That gives us 47.3 cents per 1,000. Then, credit by coke 43.4 tons at $3, gives $130.20, or 13 cents a 1,000, and tar 1,150 gallons at 4 cents—I don't think the tar will deteriorate—$46, or a total of cost of 29.7 cents. Then we have a reduction of ¼ of a candle. If we get 6 candles per gallon of oil, that will give us one-eighth gallon to bring it up to the 17-candle power, which would give us 30.4 cents against his 30.3. Then, with full-depth benches we can probably, as Mr. Somerville says, save 2 cents on the fuel. That gives us 2 cents saving for a 5 cubic feet yield. I do not advocate the 5 cubic feet, in spite of this apparent 2 cents saving, because I think when you get up to too high heats, your stoppages and other troubles, lampblack and possibly naphthaline—this extra 2 cents will be more than or about taken up by the extra labor which you may have to spend for your stopped standpipes and naphthaline troubles, but still I think Mr. Somerville's balance is a little too much in favor of the 4.75 yield.

Mr. Fitzgerald—Mr. Somerville states in his paper that when using high heats the cost of labor is reduced per 1,000 cubic feet. But my experience has been that the extra labor necessary for cleaning out stopped standpipes and heavy tar from the hydraulic main will more than balance any saving made in other directions, and the final cost of labor on high or low heats will be practically the same.

Mr. Ferrier—I was about to make the point Mr. Miller made. I was going to ask Mr. Somerville if the decreased yield of coke was the result of actual experiment or merely surmise. In the paper of M. Euchene, to which Mr. Somerville refers, is given an account of some experiments in distilling the same coal at different heats. He found that the volatile matter coming off was about the same by weight in each case. By volatile matter I mean both gas and tar, so it would seem that the increased yield of gas is at the expense more of the tar than of the coke. But I will say that I think if the coke does not suffer in quantity it will in quality to some extent, and that it will be found in distilling at high heats there is a greater percentage of breeze and small coke than there is in distilling at low heats. I might say that Mr. Somerville's experiment with Pennsylvania coal I have tried with Alabama coal, and I find that in trying to get 5 feet or over to the pound there is the same trouble with lampblack, and when I came to look over the results I found that with stoppages involving waste of gas and time there was really a less yield per pound of coal and a less yield per man.

The President—We would like to hear from someone else in this controversy.

Mr. Mitchell—Our President has had some experience in that line.

The President—My inclination is for moderately low yield.

Mr. Berkley—I would like to ask the gentlemen who advocated 5 pound yields if their results are based on long continued practice?

Mr. Runner—I would say in all cases we refer to corrected temperature. I will say further, in regard to stopped standpipes and hydraulic mains, that I have seen works where they had to have three or four men on top of the benches at times, simply because they let the thing go until it is all blocked up, and they then have to take down the standpipes and have them opened up. We don't have a stopped standpipe once a month, simply because we look after them in a systematic way. We do not allow the standpipes to stop up.

Mr. Elbert—I have had a great deal of experience with regenerative furnaces, probably as much as anyone in this country, and I do not find all these bugaboos spoken about. We do not have any trouble with standpipes or hydraulic mains. I will say, though, we put a ⅜-inch steam pipe into the bottom of the hydraulic main, about two to a section; a short ⅜-inch nipple drawn down at one end to form a nozzle, and a thread at the other end with a ¼-inch by ⅜-inch bushing made on. This nipple is bent at right angles and screwed into the bottom of the main, the nozzle headed towards the end of the main, where the tar is drawn off probably two or three times in 12 hours at the bottom and end of the main. We have two sections of main 36 feet long; that is, 3 benches. The other two sets are 2 benches long. This scheme will work up until you get 6 or 7 benches in a row. When drawing off the tar, turn on a little steam. It will take every particle of tar out, and you will not have any stopping of the hydraulic main. As far as the standpipes are concerned, it is simply the fault of the stokers. If you have your stokers trained properly (and with 7-inch standpipes which benches ought to have) you will not have any stopped pipes; if you do, it is all on account of the stokers. Of course, high heats will produce lamp-

black. The lampblack will mix with the tar which tends to stop up the pipes; but this can be taken care of. Last year (I made a memorandum before I left home), on fairly good Youghiogheny coal, our yields ran from 4.90 to 4.96 to the pound for the year. We made something like 34,469,000 feet to the bench of 9's, including carbonizing of the retorts, and something over 13 gallons of tar to the ton, and our bench fuel has always been below 20 per cent. of the coke. As far as I am concerned, I would not have anything but regenerative furnaces. We don't have any trouble with them.

The President—That is about 30 per cent. of the coke made?

Mr. Elbert—No, sir; less than 20 per cent. of the coke made. Of course, I will say we figure our coke at 66 per cent. not including breeze. I think Mr. Somerville figures his at about 61 per cent., but that would only make a very small difference in his favor, yet our per cent. of bench fuel is very much less. I have known other houses that have equally as good results, if not better. They have tried a very high yield and a very low yield. I don't know what kind of yield they are trying to get now. We aim to keep in the neighborhood of 4.90 to 5 feet. Our candle power is 16 to 17 right along. We are in a pretty cold country. We have a great range of temperature. The summer before last, during 2 or 3 weeks in July, the thermometer was 106°; and in the winter time we had 35° below zero. We get very cold winds on our benches and the retort house is narrow, but notwithstanding we manage to get along fairly well.

Mr. Dodds—In 1897 I was engaged in a plant where we were unable, on account of the quality of the tile, to run high heats, in fact we had to run very low heats, so the yield was about 7,000 feet from coal which I knew contained a little over 10,000. The quality of the gas was interesting. The saturated hydrocarbon was a matter of 43 per cent., hydrogen was very low, the gravity was fairly high for the gas. The candle power for the whole run was about 18. Occasionally it ran to 20. The calorific value was as high as 7.75, and averaged around 7.25, if I remember rightly. There was an extreme case of low temperature. I ran the same kind of coal under other conditions and obtained a little over 10,000 feet. In the latter case the hydrogen was very high, the saturated hydrocarbons low and the gravity low. The candle power on the average, if I remember rightly, was very often 9 or 10 candles.

Mr. Somerville—Of course, I knew very well I was treading on dangerous ground when I apparently advocated a moderate yield, but I simply tried to narrate the fact of the case. Mr. Ferrier knows very well that he cannot have his cake and eat it also. The extra weight of the gas is at the expense of the coke, which I put at 17 pounds, or 2½ cents. Mr. Miller says he does not think the tar ought necessarily to deteriorate in quality, but the fact is it does, and the buyers are very quick to discover it. They say they can't afford to pay as much for tar containing only pitch. Mr. Fitzgerald raises a point which perhaps I ought to dwelt more upon; the extra labor entailed in cleaning out the standpipes. We all deplore the necessity of sending the men up to clean out the pipes especially in hot summer weather. Of course, certain precautions can be taken by boring out at every charge. Say the retort is open 5 or 10 minutes for this purpose. But look at the amount of heat dissipated; the open retort at a temperature of 1,800°, the atmosphere at 60°. The law of the equalization of temperature comes into play rapidly. Does not this operation require more fuel? Surely it does. I think, Mr. President, I have nothing more to say.

On motion of Mr. Gimper a vote of thanks was tendered to Mr. Somerville for his paper.

On motion of Captain White the Association accepted an invitation from the *Evening News* to go in a body, after the adjournment at 4 o'clock, to the Soldiers' Monument, to have a photograph made of the members of the Association.

Upon motion the Association thereupon adjourned until 2 o'clock P.M.

FIRST DAY.—AFTERNOON SESSION.

The President called the meeting to order persuant to adjournment.

A TELEGRAM FROM JOHN DELL.

The Secretary read the following telegram:

"James Dunbar, Secretary Western Gas Association, Claypool Hotel, Indianapolis, Ind. This is the first meeting of the Western Gas Association I have missed since its organization. Only illness could keep me away. I wish you a profitable meeting.—JOHN DELL."

The President introduced Mr. John McIlhenny, of Philadelphia, who prefaced his paper on

GAS AND METERS,

by saying:

Mr. President and gentlemen of the Western Gas Association: The paper I have to read I would prefer to consider a "talk." It is not a technical paper in any sense. I think sometimes it is well that we pause to consider the source from which we sprang, the rock from which we were hewn. Consequently I have taken the liberty allowed an older man to be reminiscent, or to go back into the past a little.

When your worthy President, Mr. Barret, through the Secretary of this Association, did me the honor of asking me to write a paper for this meeting, I felt pleased, especially as the subject given was "The Station Meter," but a little later on, when thinking how it should be treated and what could be said, I found it would run into a lot of technicalities and statements that might not be interesting or acceptable.

Station meters are machines like steam engines or watches, which are bought and put in position to do a required work. We give ourselves no concern about the watches in our pockets, if they only keep time; and what do we care about the number of wheels, cogs and springs in them, as long as we get the exact measurement of time from their composite interior construction? The like may be said of the station meter—we are not anxious to take it apart to find out the pitch of the partitions, the angle of the hoods or the speed of the periphery. But we do know that when the station meter is installed in the gas works we have a silent monitor that never sleeps, that is accuracy itself; and I have no hesitation in saying that it is more reliable and exact than the watches carried about in people's pockets. The station meter is always what is known as the wet meter, and is absolutely positive—no guesswork about its record. When it says so many feet of gas passed through, it can be relied on.

As stated above, when I began to think about the subject, I wrote again to Mr. Dunbar and asked him to allow me a little more latitude in the treatment of it than he did in his first letter. He kindly replied, "Take all the latitude you want;" hence, the title of my subject will be "Gas and Meters," which I intend making somewhat historical, as 1903 may be called the centennial of the gas business.

Away back in the dim past, when the world was literally sitting in darkness, there were then minds and advanced thinkers who grieved about the physical darkness that came over the world after sunset. The flambeau with the wick burning in oil or melted grease, the rushlight and tallow candle were the best agents obtainable, and, indeed, only the well-to-do could afford them. Then, after a while, a great light flashes on the world! It is gas, the spirit of coal, coal gas, or, as the geologists say, the stored up sunlight of the ages in the shape of coal, that was brought to illuminate the habitations of the dwellers in cities and towns and literally to lengthen their days.

Simultaneously with the introduction of gas came a great mental awakening and desire by the advanced nations to educate the masses of the people and to increase the comforts of living. Would it be a stretch of imagination or an unreasonable deduction to say that the dispelling of the gloom in city dwellings greatly enlarged people's usefulness, and largely increased the security of life and property, by lighting the streets that before this were the haunts at night of highway robbers? And I think all this did help to lift the mental cloud that has been lifting ever since.

Gas, like many other useful discoveries, was an evolution, progressing from one stage to another till to-day; and it is not done yet. Men will keep on making and selling it cheaper, and I have no doubt that many improvements are yet to be made in the manner of using it. Gas was known to the ancients, coming as it did from natural sources, or, as it was called, burning springs and wells. All works on gas lighting treat this more or less fully, but it has really nothing to do with the distillation of gas from coal and oil, or, as we call it, artificial gas. I like to think of good old Rev. John Clayton, Dean of Kildare, as the real inventor of the gas works. Some authorities dispute the claims that posterity makes for him, but all agree that his was the first real recorded experiment. One historian says that when Dr. Clayton was sitting by his sea coal fire, he doubtless saw bright shoots of flame with hissing noise or pressure rise from the lumps of burning coal. Then, as the story goes, he filled the bowl of his clay pipe with fine coal, put on the end or over the bowl a luting of clay, which was inserted in the fire, and the gas resulting was lit at the end of the stem. This was the first gas retort. He went on making it on a larger scale, collecting the gas in bladders; behold the first gasholder! This must have been sometime between 1730 and 1740, for, in 1739, he wrote to the Hon. Robert Boyle an account of his experiments, which Boyle afterwards, with his own comments, sent to the Royal Society of London, of which he was a member. This Robert Boyle—the great Robert, as he is called—was one of the most remarkable human beings and one of the finest characters in every way that ever lived, and a wonderful scientific genius.

Boerehave says of him, "Mr. Boyle, the ornament of his age and country, had genius and talents of the highest order. We owe to him the secrets of fire, air, water, animals and plants." I introduce Dr. Clayton and Robert Boyle into this narrative to show you that through their initiative minds the modern gas business has a very respectable parentage.

But little attention after this seems to have been given to the business until 1790, when Mr. William Murdock appears. He was familiar with the writings of Clayton and Boyle, and was a practical man, a great worker and a member of the Royal Society. He is unquestionably the father of the commercial gas business of to-day. Mr. Samuel Clegg invented purification by lime and the hydraulic main, the latter being the same as to-day, and was an immense step forward.

It was not till 1802 and 1803 that any real attempt was made to introduce the business to the public by Mr. Murdock. This was 100 years ago, and it has occurred to me that when so many events are having their centennial celebrations it might be well for the gas man to have one of his own, to show the progress our business has made in that time. I will make this suggestion to the Western Gas Association, that you write all the Gas Associations of every name and kind to join us in one grand meeting in 1904, to be held in St. Louis. I think our Society is the one to take the lead in this matter, as the Louisiana Purchase and control of the Mississippi river were of far deeper concern to the Western States than to any other part of the country. Hence, I think it would be right and a graceful thing for the Western Gas Association to invite the other Associations of this country and our brethren from every land to join in celebrating our own centennial; 1904 will be just as appropriate as either 1902 or 1903, as all these years mark the beginning. I think it would be well if no other meetings were held in 1904, so as to conserve all our energy and means for the great event in St Louis. I would suggest, too, that each Society deliver its annual address at this meeting, and in it give an historical account of the Association by the orator representing each, and when these addresses are preserved in book form they will be very valuable records.

While Mr. Murdock and Mr. Winsor were working manfully to introduce and establish the business, they met with very poor success. At that time men's minds were not receptive for new things. On the contrary, innovations were ridiculed and resented, and gas had a peculiarly hard road to travel, as the people and the lawmakers professed to believe that it was a very dangerous element, and sooner or later would blow up the towns and places and kill everybody where it was introduced.

An event happened in 1814 that gave gas a great boom. This year the allied powers met in London to celebrate the overthrow of Napoleon, and all writers on the subject speak with enthusiasm of the new light, seen for the first time, no doubt, by most of the thousands who gathered in and around St. James Park, where a pagoda was erected in which there were 10,000 gas lights, which, by some contrivance, were all lighted at once. After this the attitude of the public and the newspapers changed at once, and the latter were unstinted in their praise of the gas light. They said its brightness was as clear as the summer noon, but soft and beautiful, and, among the many things said besides, was that the beauty and loveliness of women were greatly enhanced by the soft but brilliant rays. The large retinues of men and women who accompanied the representatives of the Allies carried back with them to their own countries the accounts of the wonderful illumination by the new light, and to a considerable extent gave it a better position in the public confidence than it ever had before. Still, there was something wanting—a measure to measure the gas to the consumer was needed, as everyone then in the business saw and felt. The meter had not come, and charging so much by the hour per burner would not do. Disappointment, bankruptcy and exceedingly high prices was the rule before the advent of the meter. The invention of the meter saved the gas companies. I quote from Mr. Richards the following:

"The whole history of the gas meter is one of great philosophical interest. * * * The system of charging the consumer an annual rent for a certain number of burners, on the supposition that these consumed a given quantity of gas per hour, was found to be exceedingly vague and unsatisfactory. It obviously afforded the means of so much fraud that gas companies were necessarily obliged to leave an ample margin to cover the contingencies of dishonest burning."

This was the only way known in the early days of our business, whereby a bill could be made against a consumer, and every man in this convention knows very well that his business could not be carried on under any such system. You know, too, that gas could never have been sold as cheaply as it is unless every consumer payed for exactly what is consumed. Mr. King says: "The gas meter has been of incalculable service to the gas business." Gas was an evolution, the meter was not. It was invented to fill a definite place, and the meters in use to-day—viz., the Crossley wet meter and the Glover dry meter, are the same instruments as first produced, some slight changes in construction only having been made; but the basic principles are the same, and in every country where gas is known the same meter is used.

I have often wondered why it is that an instrument which has such a good character among scientific men and those who understand it, should have so much abuse heaped on it by some gas consumers and reckless newspaper scribes. The latest slander I have heard was in a suit brought by a New York company to recover a bill. The lawyer for the defendant asked the representative of the gas company what evidence he had that the man owed the bill. The gas man said the meter. "The meter! the meter!!" shouted the lawyer; "I wouldn't believe it on its oath." There are lots of smart Alecks like this one, but for all that the meter has won by its evidence every suit at law, when gas companies have gone before such tribunals to collect bills. The famous case of the London Gas and Coke Company vs. the Northwestern Railway Company, and the equally famous case in this country of the Louisville Gas Company vs. McCauley's Theater, were both long trials, the best scientific talent being employed, and the meter won triumphantly by the admission of both sides.

One of the defects of the gas business is that it is and always has been a purely credit one, neither the seller nor the buyer knowing, until the state of the meter is taken, what the bill will be, and it is only reasonable that disappointment and objections result.

I once asked a railroad man, who was complaining bitterly of gas bills, how he would get along if he had to collect the fares at the end of the journey from the passengers who would not know how many miles they had traveled. "Why," said he, "we would have a riot at the end of each trip." Instead of that they have the prepayment system, everybody paying in advance, and the peace and comfort of the journey are not disturbed by disputes at the end. So it is with the gas consumer who has a prepayment meter. He puts a quarter in the slot and he and his good wife are astonished at how long the quarter's worth lasts, and their journey through life is made happier because the head of the house is not making life to her a burden by complaints about the size of the gas bill. I have been told by more than one gas superintendent that the complaints about bills are much fewer since the introduction of the prepayment meter, because, I suppose, of the operation on the mind when people are compelled to accept one thing, but when they have the choice of two they feel better.

I will say here what I have often said before, that gas is the cheapest thing brought into a house for use. My belief in this was greatly strengthened by having the opportunity to investigate a general charge of excessive bills collected by a gas company. The company in question had, in round numbers, 26,000 consumers, 6,000 were counted off as large customers. It was found that 20,000 had bills that averaged a little less than $2.50 a month, or a fraction more than 8 cents a day. A majority of the 20,000 had average bills of $1.50 a month, at a cost of only 5 cents a day. Now, what else could a family buy for 5 cents which would be as useful and give as much comfort as the 5 cents worth of gas? We would not consider it an extravagance for any member of the family to spend 5 cents for a car fare, or for the head of the house to buy a 5-cent cigar. These are individual expenses, enjoyed by only one, while the 5 cents worth of gas is enjoyed by the entire household.

In this historical sketch of our business I have only dealt with the initiative men, all of whom deserve our highest esteem and gratitude, and they have been benefactors to a very large part of mankind. I have not mentioned the history of gas in this country, as that would make this paper too long, but will only say now that the first gas works built in America for public use was in Baltimore, in 1817, and the first meters made in America were made in Baltimore also.

In the entire history of the gas business there have been really only two ways or systems for producing it, namely, in externally heated chambers or in internally heated chambers. Gas from coal, oil, rosin, wood, peat, etc., have been made in externally heated vessels, and, as far back as 1825, water gas was attempted in heated pipes. To Mr. Thaddeus S. C. Lowe, now of California, we owe the great invention of water and oil gas produced in internally heated chambers, properly known as the Lowe process, which has been of immense advantage to the gas interests of this country, and came at the opportune time when petroleum was discovered, and at a time, too, when a higher candle power was needed to check the encroachments of the electric light. Remembering, as I do, the controversy that continued for years about

the merits of the two systems, and being a coal gas man at that time I am glad now, after the strife is over, to have the privilege of rendering this tribute to Mr. Lowe.

In closing, I will say I indulge the hope that some of our well educated young men will undertake to write a history of the gas works and gas men in the United States. The history of any country is only the history of its great and leading characters, and so it is of any business or calling, and our business has had many men the story of whose lives is worth preserving.

Discussion.

The President—Gentlemen, you have listened to a very delightful series of reminiscences. What is your pleasure in regard thereto?

Captain White—In arising to move a vote of thanks to the writer of this paper, I do so with the sense that, coming from such a source, it could not fail of being instructive and interesting. Possibly no other man in this Association could have been more appropriately selected to prepare such a paper than Mr. McIlhenny. He has served long years in our industry, touching it on all its sides, acquiring experience in its every official rank. Therefore, it is eminently fitting for him to give us these reminiscences and call our attention to the fathers of the industry, bidding us pause in the discussions of our technical problems and give heed to the struggles of the men who, without special training, without the guidance of precedent or the aid of the literature of an established profession, laid so sure and strong the foundations upon which we are to-day erecting the safe structure of an unexampled prosperity. Too much credit cannot well be given to these early founders of a giant industry that has so greatly added to the broadening of civilization and the comfort and happiness of mankind. I quite agree with the writer of this paper that it is exceedingly desirable that our literature should be enriched with a history of the rise and progress of the gas industry in the United States, and I sincerely trust that such a work will yet be forthcoming. It is well for us, of the later generations of gas men, to know that we are worthy scions of the men who, coming from the training schools of the old-time shop and foundry, from commercial life, together with a few men of high scientific attainments, crossed boldly into an unknown, undeveloped industrial field, daring its risks, blazing their way as they went, teaching themselves and the public, and finally handed down to their immediate successors an established business that their efforts had raised to the dignity of an acknowledged place in the world's necessary professions. It is with hearty pleasure that I move a vote of thanks of the Association to Mr. McIlhenny.

The motion was seconded and carried.

Mr. Gimper—A thought in this paper has not been touched upon, and I wonder whether the Association had not better act on it It is where Mr. McIlhenny says he thinks it would be proper for the Western Association to invite the other Associations of the country to join in a celebration of our Centennial.

The President—I think, perhaps, a motion referring so much of that as pertains to the place of meeting to the Committee on Place of Meeting for next year would be proper and might be productive of good, but the selection of the place is in the hands of that Committee. It might influence the Committee. I would be glad to entertain a motion to such effect.

Mr. Howard—I think it should be referred to the Committee on Next Place of Meeting. The discussion, of course, amongst the Committee would be with a larger attendance for discussion than if committed to the care of the Board of Directors. I move to refer the matter to the Committee on Place of Next Meeting. [Adopted.]

ELECTION OF OFFICERS.

The President—We are about through with the ordinary schedule for the afternoon session. It has been suggested that we proceed to the election of officers in order to do away with a night session. If there is no objection we will take that course. [So ordered.]

The President called for nominations for the office of President for the ensuing year. The only nomination being that of Mr. F. H. Shelton, of Philadelphia, Pa., on motion the Secretary was instructed to cast the ballot of the Association for Mr. Shelton, which was accordingly done, and Mr. Shelton was declared elected President for the ensuing year.

The President—Mr. Shelton, it affords me a great deal of pleasure to announce to you that you have been elected President for the ensuing year.

Mr. Shelton being called on for a speech, responded as follows: It is not giving the retiring President half as much pleasure as it gives me, I am sure! I feel very much gratified at the courtesy you have shown me and particularly because I am not in the territory chiefly covered by the Western Association. As an Eastern resident, and most of my business in the East, I think it is a great compliment to be asked to preside for a year over your deliberations, and I feel, too, that as one of the younger men of the Association it is a compliment to be put above older men even for a short time, and I certainly shall do my uttermost to "make good," as the expression is. I have tried to be a worker in time past--I think with some fair measure of success—to advance the work of the Association, and I look upon the position of President as simply a greater opportunity for advancing the Association's work. It has its responsibilities as well as its pleasures, and while I am enjoying the compliment (I am frank to say I do enjoy it; it is a thing we all appreciate under such circumstances), I none the less feel that the greater thought is how to use the opportunity that is given to advance the interests of the Association. The condition is peculiar this coming year. By virtue of the action of the Council yesterday—exercising a mean advantage when I was away, not present to protect my interest—and when I arrived in the afternoon, I was told the Council had resolved not to have any Executive Committee in future, but to place the control of Association work in the hands of the President. I have not figured out whether they felt with due humility that with me as President they could not comparably associate, the Executive Committee being so completely outclassed, or whether they felt it the other way; that they did not propose to "stand for" *me*, consequently they would all get out! At any rate I will be left to run things alone. In all my experience in gas companies I have found the manager or superintendent who is not interfered with by a Board of Directors is always happiest and perhaps in many ways most successful in his work, and it certainly seems as though I would occupy such a position this year. Even our retiring President, Mr. Barret, has established, with great courtesy, a new precedent to lessen my work, by his courage in omitting the traditional presidential address. He foresaw that it would be difficult for me under the conditions at St. Louis where there is quite a likelihood the meeting will be held, to hold any respectable crowd together, and did that now which might make it easier for me to curtail my work. However, I will not make any promises as to presidential address or other features, but seriously speaking, I will simply try to "make good" next year, in 1904. I thank you. (Applause.)

Mr. O. O. Thwing, of St. Louis, Mo., having been nominated for First Vice-President, on motion the Secretary was instructed to cast the ballot for his election. The Secretary reported that he had followed the instruction, and the President informed Mr. Thwing of his election.

In response to calls for Mr. Thwing that gentleman said: I will only say I thank you sincerely for this expression of your good feeling towards me. (Applause.)

The President announced that the next order was the election of Second Vice-President. Mr. Paul Doty, of Detroit, Mich., and Mr. K. M. Mitchell, of St. Joseph, Mo., were nominated. Upon a ballot being taken the tellers announced 28 votes for Mr. Doty, and 21 for Mr. Mitchell. Voting 49. Mr. Doty was thereupon declared elected to the office of Second Vice-President. Responding to the announcement Mr. Doty said:

Gentlemen of the Western Association: I desire to assure you of the extreme pleasure and gratification that I feel over this mark of your confidence in me. I feel somewhat that I can steal the thunder of Mr. Shelton, in saying that I was an Eastern man. I am not one now. I am a Western man. I am part of it, my sympathies, my hopes, my ambitions are all in the West; this Middle West that is represented here so strongly in this Western Gas Association. In a gathering of this kind, my associates, members, fellow workers, it cannot help but stir the heart of any man, and make him feel he is a better man by having been singled out for such a mark of distinction.

The President announced that next in order was the election of Secretary and Treasurer.

On motion of Mr. William McDonald, the President was directed to cast one ballot for Mr. James W. Dunbar as Secretary and Treasurer of the Association. The motion was seconded, put to vote and declared unanimously carried. The President announced the result, and in response to calls Mr. Dunbar spoke as follows: Gentlemen, I accept with pleasure the result of your decision as to who shall serve you as Secretary during the coming year. One of the greatest pleasures of my life is to serve you as Secretary, and the reason is that by so doing I am able to come in contact and intimate association with some of the best fellows on earth. (Applause.) I assure you that there is no companionship or friendship that I appreciate more than those I have enjoyed and come into by reason of being a member of this Association. (Applause.)

Mr. W. E. Steinwedell, of Cleveland, O., was placed in nomination for the Editorship of the Wrinkle Department. On motion, the Secre-

tary was directed to cast one ballot for the election of Mr Steinwedell, which was done, and Mr. Steinwedell was declared duly elected.

In response to calls, Mr. Steinwedell said: I can only say I will do the very best I can, with the understanding that Mr. Miller run for the position next year, in accordance with his promise.

The election for Directors resulted as follows:

To serve two years—Messrs. K. M. Mitchell, St. Joseph, Mo.; Wm. McDonald, Albany, N. Y.; Thomas D. Miller, New Orleans, La., and John D. McIlhenny, Norristown, Pa.

To serve one year—Mr. D. R. Warmington, Cleveland, O.

The Association thereupon adjourned, to reconvene the following day at 10 A.M.

SECOND DAY—MORNING SESSION.

The Association was called to order at 10 A.M. of the second day. The first business was the consideration of the report of the Committee on Applications for Membership, who recommended the following gentlemen for election:

Active.

Blauvelt, W. S., Detroit, Mich.
Crowley, J. P., St. Paul, Minn.
Carson, G. S., Iowa City, Ia.
Dougherty, D. J., Jacksonville, Fla.
Forbes, C., London, Ont.
Fitzgerald, B., Cleveland, O.
Gimper, E. H., Galveston, Tex.
Griffin, T. M., Muncie, Ind.
Geist, C. H., Chicago, Ills.
Haines, J., Des Moines, Ia.
Hartman, W. E., Norfolk, Va.
Lyman, L. G., Pueblo, Col.
Murphy, C. A., Ottawa, Ills.
Morton, H. E., Boone, Ia.
Mockett, W. E., Dallas, Tex.
Marshall, W. D., New Orleans, La.
Miller, C., Chicago, Ills.
Meaker, C. A., Muncie, Ind.
Moreland, M. A., Chicago, Ills.
Purcell, T. D., Chicago, Ills.
Pearson, J. R., Indianapolis, Ind.
Reitmeyer, A. F., Perth Amboy, N. J.
Springer, E. S., Leavenworth, Kas.
Spinning, W. V., Peru, Ind.
Strolin, R., La Grange, Ills.
Vollum, W. H., New Orleans, La.
Walsh, J. T., Chicago. Ills.

Associate.

Brownell, E. E., Dayton, O.
Dresser, S. R., Bradford, Pa.
Gilman, G. P., Jr., Chicago, Ills.
Kellum, B. J., Chicago, Ills.
Lea, H. I., Fort Wayne, Ind.
Parker, R. H., Chicago, Ills.
Pattum, W. H., Chicago, Ills.
Patterson, M., Cleveland, O.
Plantinga, P., Cleveland, O.
Schall, H. B., Chicago, Ills.
Shirra, J. C., Milwaukee, Wis.

ELECTION OF NEW MEMBERS.

On motion of Mr. J. B. Howard, Mr. Wm. McDonald was authorized to cast the vote of the Association in favor of the applicants named.

The President welcomed the new members and expressed the hope that they would freely take part in the proceedings.

ROLL CALL.

Roll call disclosed the presence of the following:

Honorary Members.

Harbison, J. P., Hartford, Conn.
White, W. H., New York City.
Howard, J. B., Galena, Ills.

Active Members.

Atkinson, G. G., Goshen, Ind.
Barret, A. H., Louisville, Ky.
Barron, A. M., South Bend, Ind.
Berkley, J. M., Mobile, Ala.
Blinks, W. M., Michigan City, Ind.
Bowers, W. L., Davenport, Ia.
Bredel, F., Milwaukee, Wis.
Buck, E. H., Vincennes, Ind.
Butterworth, I., Denver, Col.
Clapp, G. N., Middletown, O.
Collins, C., Elkhart, Ind.
Cooke, A. S., New York City.
Copley, I. C., Aurora, Ills.
Cowdery, E. G., St. Louis, Mo.
Cowdery, R. E., Topeka, Kas.
Cressler, A. D., Fort Wayne, Ind.
Diall, M. N., Terre Haute, Ind.
Dickey, C. H., Baltimore, Md.
Doty, P., Detroit, Mich.
Doherty, H. L., New York City.
Dunbar, J. W., New Albany, Ind.
Elbert, V. L., St. Paul, Minn.
Elston, I. C., Jr., Keokuk, Ia.
Enright, J. H., Carthage, Mo.
Ferrier, J., Columbus, Ga.
Fitzgerald, J. H., Houston, Tex.
Forbes, J., Chattanooga, Tenn.
Forstall, A. E., New York City.
Freese, F. W., Fort Wayne, Ind.
Fullerton, G., Jr., Buffalo, N. Y.
Gerould, C. L., Galesburg, Ills.
Gimper, J., Galveston, Tex.
Goodnow, G. F., Waukegan, Ills.
Haase, E., Milwaukee, Wis.
Harper, G. H., Altoona, Pa.
Howard, C. A., Aberdeen, S. Dak.
Hyde, H. H., Racine, Wis.
Jones, T. C., Delaware, O.
Keller, C. M., Columbus, Ind.
Kelley, F. W., Davenport, Ia.
Knight, C. S., Fort Wayne, Ind.
Landon, H. McK., Indianapolis, Ind.
Leonard, W. H., Chicago, Ills.
Lloyd, E. F., Detroit, Mich.
Luther, F. E., Chicago, Ills.
Lynn, J. R., Waterloo, Ia.
Lynn, J. T., New York City.
Mansur, J. H., Royersford, Pa.
McDonald, D., Louisville, Ky.
McDonald, W., Albany, N. Y.
McIlhenny, J. D., Philadelphia, Pa.
McKee, J. M., Meridian, Miss.
Miller, T. D., New Orleans, La.
Miller, A. S., Baltimore, Md.
Miller, I. A., Colorado Springs, Col.
Mitchell, K. M., St. Joseph, Mo.
Morrell, E. E., Oak Park, Ills.
Moses, F. D., Trenton, N. J.
Murdock, G. T., Elkhart, Ind.
Murdock, J. W., Joliet, Ills.
Norris, R., Philadelphia, Pa.
Nutting, C. H., Chicopee, Mass.
Olds, H. L., Bloomington, O.
O'Malley, P., Aurora, Ills.
Page, C. H., Jr., Philadelphia, Pa.
Perkins, B. W., South Bend, Ind.
Pratt, E. G., Milwaukee, Wis.
Quinn, A. K., Newport, R. I.
Roper, G. D., Rockford, Ills.
Runner, Z. T. F., Freeport, Ills.
Salter, W. J., Florence, Ala.
Searle, R. M., Mount Vernon, N.Y.
Shelton, F. H., Philadelphia, Pa.
Slade, R. E., Lockport, N. Y.
Somerville, J., Indianapolis, Ind.
Steinwedell, W., Quincy, Ills.
Steinwedell, W. E., Cleveland, O.
Stephens, A. K., Washington, N.C.
Sweetman, M. M., Kansas City, Mo.
Thwing, O. O., St. Louis, Mo.
Wallace, W., Lafayette, Ind.
Walker, E. M., Hyde, Park, Mass.
Walker, S. R., Bay City, Mich.
Waring, G. H., Omaha, Neb.
Warmington, D. R., Cleveland, O.
Warmington, G. H., Cleveland, O.
Whysall, G., Evansville, Ind.
Witherby, E. E., New York City.

Associate Members.

Barnes, G. W., Pittsburg, Pa.
Buckley, J. C., Chicago, Ills.
Carpenter, H. A., Pittsburg, Pa.
Claybourne, C. W., Chicago, Ills.
Corbus, F. G., Cleveland, O.
Eaton, A. B., Chicago, Ills.
Elliott, H. J., Chicago, Ills.
Gassett, A. L., Detroit, Mich.
Guldlin, O. N., Fort Wayne, Ind.
Harper, H. D., Chicago, Ills.
Hayward, S. F., New York City.
Helme, W. E., Philadelphia, Pa.
Jacobs, C. H., Detroit, Mich.
Johnston, E. D., Connersville, Ind.
Lindsay, C. R., Chicago, Ills.
Martin, J. H., Chicago, Ills.
McDonald, D., Albany, N. Y.
McIlhenny, J., Philadelphia, Pa.
Osius, G., Detroit, Mich.
Parker, G. W., St. Louis, Mo.
Persons, F. R., Toledo, O.
Russell, D. R., St. Louis, Mo.
Stacey, A. J., Cincinnati, O.
Steward, R. B., Chattanooga, Tenn.
Terhune, C. F., New York City.
Wickham, L., St. Louis, Mo.
Witherden, G. M., Philadelphia, Pa.

REPORT OF COMMITTEE ON NEXT PLACE OF MEETING.

On call from the President the Committee on Place of Next Meeting, through Mr. F. H. Shelton, submitted the following report:

It seems the prevailing idea of the membership of this convention to hold its next meeting, in 1904, in the city of St. Louis, in view of the Exposition feature that will there exist, and to which many of the members will probably desire to go in any event. In accordance with that feeling the Committee decided to recommend St. Louis as the place of meeting. At the same time this report of the Committee to that effect can be accepted or rejected by the members, of course, at their pleasure. I might say the sentiment seemed to be so general for St. Louis that no other place was either mentioned or suggested. The Committee felt that the selection was not entirely ideal. It is hard to have anything but hurried sessions and irregular attendance in Exposition years, but there seemed to be no nearby town in which we could meet and then adjourn to St. Louis without going a considerable distance. The Committee finally concluded that St. Louis would be the place after all, and it so reports.

On motion of Mr. William McDonald, the report of the Committee was received and adopted.

REPORT OF COMMITTEE ON PUBLICATION OF PROCEEDINGS.

Mr. O. O. Thwing, of St. Louis, read the following report from the Committee on Publication of Proceedings:

To the President and Members of the Western Gas Association: Your Committee regrets to report that it has been impossible to issue a volume of the "Proceedings" during the past year.

The next volume will include the Proceedings of the years 1899, 1900, 1901 and 1902. This volume is in preparation and will be published during the coming year.

O. O. THWING, Chairman,
ALTEN S. MILLER,
WM. MCDONALD,
} Committee.

May 21st, 1903.

On motion of Mr. Miller the report was accepted and the Committee continued.

REPORT OF LIBRARY COMMITTEE.

Mr. F. H. Shelton, from the Committee on Library, presented the following report:

To the Members of the Western Gas Association: You will remember that 2 years ago the George T. Thompson library was bequeathed to this Association, and that its custody, and the best way to make it of use to the members, was left in the hands of this Library Committee, then created for that purpose, and that about the same time I recommended the making in particular of a card index for references to gas books and articles, and that this work was authorized and left in the hands of the Library Committee.

Referring, first, to the library, the Committee has been disappointed in its small use by the members, and is somewhat at a loss to account for it. During the year scarcely half a dozen books have been called for. The number of books is over 200, and they cover a wide range of subjects directly pertaining to our daily business. It would seem as though they should be used to a greater extent than has been the fact. The Committee, surmising that possibly the rules may not be practical, or in some way objectionable, or that the library has not been sufficiently advertised, will greatly appreciate it if any of the members with ideas or feeling on the subject will kindly point out any weaknesses, in

the discussion of this report. It is felt, in part, that greater publicity, to make the library better known, might be well for the present at least, and that possibly the information regarding it (in the back of the printed list of members) is rather obscure, so it is recommended that, until further notice, the list of books, rules and information concerning it be printed and mailed separately and in large type and form, and that a brief quarterly bulletin be printed and mailed each member, advising and reminding of the library, and of additions to it.

The thanks of the Association are extended by the Committee to those who have donated books during the year: Messrs. J. B. Howard, Wm. McDonald, Albert Dunbar, Jas. Dunbar, A. H. Barret, Holyoke (Mass.) Gas Co., and F. H. Shelton.

It is needless to say that further contributions are earnestly requested. Only by the members helping can the library be built up into the comprehensive, complete and helpful feature that it ought to be of our Association work.

As to the "Card Index." You will recollect that this was extensively advertised and broached, and that it was started as a subscription undertaking, costing each member from $10 to $50 a year, somewhat according to the size or nature of the company. A good number of subscribers was secured, but the first year went by without progress in the work, owing to not being able, for a variety of reasons, to secure a suitable man to do the work of indexing. Half a dozen men were considered, but could not undertake the work for one reason or another. In order to avoid further delay, I decided thereupon to do what I could, and to start the work myself; and I personally, this past year, have prepared that which the Committee now returns as its first delivery or part of the work.

I take pleasure in submitting herewith a card index of some 1,340 references to books and articles on gas subjects. It is the key to almost anything in gas that one wants to know. That is, it directly tells one where one can find the latest articles on any subject, or what books there are. For instance—at random—one is looking up tar pavements. There are references to 6 recent articles on that subject. One is interested in coke ovens. There are references to about 25 different articles on the subject. One wants to read up inclined retorts. There are about 25 articles also, etc., etc. The references are in printed card form packed in cardboard boxes about 4x5x18 each, and are classified into 77 different subjects, from coal bins, concrete specifications, underwater mains, or anything else in the practical line, to the driest articles on taxation, depreciation, municipal control and other controversial topics.

This index includes every paper that has been presented to the New England, the American, and the Western Associations, from the beginning of each. It includes every book (some 200), that I could get track of, as ever published, pertaining to the gas business; and it includes every paper of the Ohio, the Michigan, the Pacific, and the Texas Southwest Associations, of the last five years, and every other article that seemed practically worth while, that has appeared in the American Gas Light Journal for the past five years—that is, from 1898 to 1902, inclusive—and this includes many English papers reprinted. The index in brief, covers practically all current references and the best current thought on gas topics.

Do not think, however, that because it exists, your condition will automatically improve. It is not worth 10 cents unless it is intelligently used. Books unopened teach nothing. Books themselves are worthless to the sluggish, or to those who do not seek in their pages, or do not try to read them. But to the earnest worker, to the man who wants to know more about some certain topic, this index will, in my opinion, tremendously help.

As to the continuance of the work: What is in hand is good, but it can be enlarged by indexing papers and articles in the last 10 to 15 years, many of which are standard and most helpful, and it should be kept up. The Committee recommends that the Committee be continued, that the Association allottment of $250 be renewed, that the best arrangements possible be made by the Committee for the indexing of this year's articles and as much of previous years as feasible.

Finally, to those who use the index, these points: It is not supposed to cover presidential addresses, experience and advertising departments or wrinkles, which it is hoped to sometime have collected and separately published, natural gas, acetylene, legal decisions of local interest only, patent processes not tried out, and general subjects, such as heat, coal, steam, etc. It aims to be a practical gas man's index to recognized gas subjects. If one has a file of the Journal an article can be read at once. If not, go to the nearest company that has a file and read up. And to those of you who may contemplate getting any of the books referred to (if they are not in the Association Library to be borrowed), I shall be more than glad to reply to any inquiries as to character, size, price, where they can be procured, etc.

Respectfully, F. H. Shelton, Chairman, Wm. McDonald, O. O. Thwing, A. H. Barret, Jas. Dunbar, } Committee.

At the close of the report Mr. Shelton further said: In regard to this index I would like to give you an idea of its completeness. It is printed in three colors. White cards are references to articles in journals and gas papers. Pink cards are references to books on the subject. Yellow cards are the tab guide or subject cards.

Mr. D. McDonald—You have not stated how it is to be obtained.

Mr. Shelton—By a subscription of from $10 to $50 according to the size of one's company. The Committee has seen fit to print 300 sets to take care of probable requirements. There are approximately 100 subscribers to the work already, and the balance it is proposed to carry in stock for future years for this Association, because there will undoubtedly be calls for them in future, and it gives something to go on. It is just as easy to print 300 sets as 200 sets. They will be ready as soon as the cards can be assorted. They are printed, and can be sent out soon. The Committee decided that the subscription, to enable the creation of this index, by gas companies should be graded according to their output; that it would be rather illogical for a city like Milwaukee, credited with paying its bills and having some reserve, to get this and pay for it, and pay no more than a little company in a town of 5,000 population, way back in the State. It was felt that the information was certainly worth $50, to larger companies, which is the maximum scale, and if it was worth anything to a small company, it was worth $10, and they have been divided into five grades of subscription, $10, $20, $30, $40 and $50 on a sliding scale of outputs. The Committee further concluded that trade interests and other people who might desire to have this index, might get it on the basis of the smaller gas companies by a point blank subscription of $10 a year for the 3 years.

The President—You have heard the report of the Committee in regard to this index, whose members have done an immense amount of work in a direction that will be of very great benefit to the Association. What is your pleasure?

On motion of Mr. D. McDonald the report was accepted with the thanks of the Association, and the Committe was ordered continued.

The President introduced Mr. Bell W. Perkins, of South Bend, Ind., who read the following paper on

INCREASING SALES OF GAS TO EXISTING CONSUMERS.

"How shall we increase the sale of gas to existing gas consumers?" is best answered by saying, "Get out and hustle;" but the hustling can be very materially aided by conditions that can be brought about by the efforts of the people in charge, viz.: A feeling of confidence between consumers and the gas company, good advertising, the good will and opinion of the press and the same of the city government.

I would not attempt to lay down an absolute plan. I will make a few suggestions with the hope that they, with any discussions that may follow, will fully answer the question.

Without a feeling of confidence between the consumer and company it is well nigh impossible to get a consumption beyond what one might think is absolutely necessary. On the other hand, if the consumer has implicit confidence in the company with which he is dealing, it is much easier to present a convincing argument as to the merits of appliances which you may seek to sell. The ways to establish this confidence have been dwelt upon by writers of other papers, and consist mainly in not permitting any dissatisfaction to exist. If the consumer has a large bill there must be some reason for it. The size of it was not made by the company but by the consumer himself, and it should be the company's business to ascertain the cause. In many cases it may be very easily determined by the use of a complaint meter. It is not always possible to make an exact explanation of large bills, but it can be done in a majority of cases. For instance, people using stoves will not be as careful in lighting and extinguishing them in winter as in summer, as heat in cold weather is as desirable as it is undesirable in summer, and their personal comfort is a greater incentive to economy in hot weather than in cold weather. Their needs, so far as cooking is concerned, are no greater one month than another; but cold weather will show larger bills for cooking than summer, and without an explanation the consumer will naturally think he is getting the worst of it. If meter inspectors make an error in taking the meter statement, the right thing to do is to acknowledge it and correct the mistake at the time, or the following month, as the consumer might prefer. We are all mortal and prone to err, and the consumer will think much more of you, if the mistake has

been made, to acknowledge it, rather than to make him believe he has burned the gas.

With a feeling of confidence between consumer and company it is possible to get the consumer to use gas for everything that requires heat and light, with the possible exception of continuous heating, as is proved by different people on the same street using gas for so many different purposes.

For instance, Smith uses gas for cooking, Brown uses it for lighting and uses coal for cooking, Jones uses gas only for a couple of grates, lights his house with electric lights, and has his cooking done with gasoline and coal. Now, if they each find it economical to use for their different purposes, it would seem that each, with proper arguments, could be induced to use it for all purposes mentioned.

The service pipe and meter are originally put in for light or fuel, and sometimes for both. If for one purpose only, the consumer repeatedly visited by a solicitor, and on his failure, another can generally get the fuel consumer to put in lights; if not the whole house, get one light, and later the whole place can be secured. He must constantly keep the fact before the people that gas is the best and cheapest light per candle on earth. It is the most reliable. It can be turned up or down, and the requirements large or small constantly met. It never goes out. In short, it is the best light that money can buy.

If the consumer uses gas for light, he uses the same arguments as to gas for fuel. These facts should be impressed on your solicitor so thoroughly that he will be an enthusiastic believer himself, as no one can tell the merits of gas as well as those who believe in it themselves. If the consumer uses gas for both illuminating and cooking, sell him a water heater, either circulating or instantaneous, a gas grate or log for his fireplace, a heating stove for an occasional cold day, spring or fall, also a small heater for his bathroom at any time, a boiling stove for heating small quantities of water elsewhere than the kitchen, etc., etc.

If coal stoves are used for heating, sell them a Bunsen tube to light their fires with. This will do it right and not smut the mica. Gas ranges can be used in churches, lodge rooms and society halls, and no trouble will be experienced in starting their sale if there is the slightest need for them, or if the arguments are brought forcibly to them.

Scarcely a place can be found that could not find some use for gas. People as a rule do not know how many useful purposes to which gas can be put. Among them might be mentioned: Cooking, heating, laundry work, water heating, both circulating and instantaneous, distilling water, lighting coal fires, brazing, heating Japanning ovens, tempering steel, brazing paint burning, heating moulding machines, ripening bananas, general dental uses, coffee roasting, peanut roasting, heating candy to soften it, wood embossing machines, heating glue pots, heating cylinder for bending veneer, heating wax for harness sewing machines, heating card embossing machines, heating copper half-tone plates, soldering iron furnaces, re-curing tobacco in cigar factories, bookbinders, shoemakers, jewelers, water bath for keeping things warm, heating ventilating flues, china kilns, heating small steam boilers, meat broiling in refitted charcoal broilers, gas engines, enameling ovens, etc., etc.

Gas arc lights, if rented by the gas company, will prove one of the best increasers of consumption, as well as a profitable investment from which to derive an income for rental. Likewise, appliances, stoves, etc., sold at prices and installments that people can pay.

Personal visits of the manager or some other competent person to factories, etc., will be productive of good results, as he will notice places where gas can be used with profit to the owners and the gas company. For example, the writer was in a paper box factory recently on some business other than gas, and on going through one of the rooms noticed that the folding machines used steam heated glue pots. It only took about five minutes to show the owners that a circulating water heater could do the work better and cheaper in summer than they could keep a steam boiler fired up. Numerous other jobs have been secured in this way.

To systematically work the territory a card index should be kept, and corrected at intervals, of every house along the lines of mains showing what each used for lights, fuel, etc. From this can be kept small books with the information tabulated under the street numbers for the use of the solicitor. These will enable the solicitor to put his time where it will do most good.

He can make his visits for a distinct purpose, and not annoy people by useless questions, or trying to sell them something they already have. Among the best advertisements a company can have are people who are using gas appliances they are satisfied with. If the housekeeper has an appliance in her kitchen that lightens her work and raises the standard of her cooking, she is sure to tell others. So if she is satisfied with some gas appliance that she may be using, she will be the means of making the path easy for your solicitor among those not supplied, when he makes his visits. Good newspaper advertising is very essential and necessary, as it brings you in contact with people you would not reach by any other means. If the gas "ad." appears in the paper every day, and in places where the reader cannot help but see it, it will in time bring many a consumer that would not be interested otherwise. Newspaper advertising cannot be too highly recommended.

There is a good deal of advertising that can be done outside of newspapers. Bulletin boards can be utilized, posters can be used, attractive printed matter that is furnished by manufacturers can be judicially distributed. Puzzles and booklets can be given the children, as one very good way to reach the mother is to get into the good graces of her children.

The good opinion of the press is also very necessary. Public opinion is moulded by the press of the country, and if your local newspaper says nice things about you, the readers will say the same, and it is certainly better to have them say nice things about you than to have them tell their readers that you are a gang of highwaymen, always ready to hold them up, that your meters are wrong, that your prices are too high, etc. Newspaper men, as a rule, are intelligent people who are open to reason. Take them into your confidence to a certain extent, and they will be your friends. If you have satisfied customers, you will very likely have good friends in the newspapers. It is a kicking, discontented public that usually makes a kicking newspaper.

The good will of the city government is likewise essential, and cannot be too highly recommended. They have it in their power to cause many annoyances, and people are as ready to believe their acts right as they are to believe the newspaper, and, as a general proposition, one is backed up by the other.

Discussion.

The President—You have heard a very interesting paper by Mr. Perkins on a topic that is one of the most interesting features connected with gas companies—the commercial side. I would be glad to have it thoroughly discussed.

Mr. Searle—In one community we have had a notable increase in gas bills, particularly among new houses. We opened up a special set of records to keep track of those increased bills and find the cause of them, and if found legitimate we proposed to maintain that increased business with the old consumers. The investigation showed that the return to the use of dark wall paper had materially increased the gas bills in new homes, where they first depended on white walls for the first year, and then turned to the tapestry papers now in vogue. We found many cases of rooms with white plastered walls that formerly had been lighted by 1 open flame burner, but after the new papering was put on they would need about 3. Of course, then they blamed the gas company right along. We argued that the tone of the paper had darkened the room and satisfied them, it was so. This resulted in the installing of 7 or 8 Welsbachs, 3 or 4 of which were used in the dining rooms and libraries, and resulted in an increase among those consumers of 15 to 30 per cent. consumption, all from the use of dark wall paper.

Mr. John D. McIlhenny—Mr. Perkins has so well covered the subject that he leaves very little to be said. I would call especial attention to the advantage of cultivating the sale of gas for industrial purposes. I believe gas companies have neglected that field of their business more than any other, and it is a most desirable field. In industrial consumption the use is entirely throughout the day; it is continuous use, and we all know that the more continuously any product is used the more profitably we can sell it. I think that bills for industrial gas are paid more willingly also than any other class of gas bills. The man recognizes that it is part of his business. I believe we should use every endeavor to find out the avenues by which we can sell gas for industrial purposes, and to follow them up. I believe that it will pay where a consumer can be secured for industrial purposes to make almost any arrangement with him as to appliances; give him the appliances if necessary, in order that gas may be used. I know personally of several lines which have been developed most profitably by the gas company buying even an expensive appliance and placing it in use upon trial.

Mr. Shelton—I would like to bring out just one point that especially impressed me in that paper; that is the value of newspaper advertising. Of course, all advertising is good, and no one can say any one channel is the only way by which to advertise; half a dozen or a dozen different ways should be used. But I have had one or two cases of such remarkable growth in towns where we have used the newspapers to a large extent, that I have been forced to the conclusion that there must be even more in newspaper advertising than I have heretofore credited it

with. There is one city with which I am connected in which we have carried every week either a full page or half page advertisement. That would cause some of the earlier traditions about advertising in the business to be jarred a good deal—spending such an amount (several thousand dollars) for half and full page advertisements; but we grew in that city last year from all causes—prosperity, coal strike and everything else, We grew nevertheless 79 per cent. from the year before, and while much of that came from other causes, I do feel convinced that our tremendous newspaper advertising, that went into every home (not in half columns or two or three columns, or only part of a page at the top, but over a whole page—gas engines one week, gas ranges another week, changing from week to week) convinced the people that our educational campaign was worth studying. They looked for the gas news each week—I have no doubt it helped us tremendously. In that connection practical politics comes in. It was necessary to raise the price of gas in that city last winter, under the conditions of the cost of fuel. We had been selling for $1, and we put the price up to $1.25. Under ordinary circumstances I think the newspapers would have been pretty "quick on the trigger" and gone for us pretty hard, because it did not cost them anything, and they would probably get the approbation of the public, but knowing that they got a revenue from the gas company of several thousand dollars a year, it made them a great deal more cautious and careful as to what they said. They thought twice before they criticized that raise in the price of gas. I don't mean to say it was undue influence, but I do mean to say if there are fair business relations between the gas companies and the newspapers through the medium of the purchase of space in their columns, it makes the newspapers more reasonable in their point of view, and more fair in what they do say, rather than disturb such existing relations as result from liberal advertising.

Mr. Rice—I notice the gentleman advocates the renting of gas arc lights. I believe that is a mistake. We started to rent gas arc lights in Norfolk, Va., but after a year's experience became doubtful about it; some began to come back to us. We wrote to a considerable number of our friends, and the replies when they came in surprised us; they were from large gas companies and small ones, and a great majority of them were decidedly against the renting of gas arcs. We have switched around our entire business, and put our gas arcs on the installment basis, so they will ultimately become the property of the consumer. We have ceased renting any more lamps; only sell them on short time. At the present low cost of $7 it is easy to sell them, and once owned by the consumer they will stay in use, while with a constant rental charge we feel they would sooner or later be discontinued. We maintain arcs at a low cost to the owner.

Mr. Enright—I would like to call attention to a little inconsistency on this matter. We are in the electric light as well as the gas business. We put in an electric arc free of charge; I don't know of any electric company that doesn't do the same thing. We sell gas arcs at cost. I would like to have some gentleman tell me why it is that gas companies cannot be as liberal in this line as electric companies. The electric people put out the best inclosed arc without asking any questions whatever. They simply get the best arcs and put them in and keep them in repair; series arcs they trim every day. I have heard of one or two cases where gas arcs were put out free, but they are the only ones that I know of. I firmly believe we could do as well in that line as the electric people do. It seems we are a little too conservative on several points. In pushing gas arcs I don't go around to our electric consumers, but I do call very frequently on the other fellow's people. I simply call and ask the privilege of putting Humphrey arcs in on trial free of charge for a period of 10 days, and at the end of that time they can be sold to the party at cost if he desires to purchase them. Out of the first 50 introduced in this way 40 of them stuck, and I sold to those parties at cost. Where it is possible the lamp should be the property of the consumer. I think it is better that he should own the lamp; however, this will be largely a local matter. We keep our gas arcs in A-1 repair free of cost to the consumer, excepting mantles, which they cheerfully pay for.

Mr. Butterworth—Mr. President, I think we are somewhat losing sight of the gist of Mr. Perkins' paper, which is that it is much more desirable to cultivate the increased use of gas on the part of existing consumers than to cultivate new business. Out in Denver we are so fully convinced of that policy being a good one that we are now putting the major part of our energy into cultivating the use of more gas on the part of existing customers. Heretofore we have been paying our solicitors ("representatives," we call them, because the word "solicitors" has the suggestion of book agency) commissions based on the number of new appliances sold. Hereafter we shall pay them on the basis of the increased gas sales that they produce. I think probably an increase of 5 per cent. on the part of existing consumers is better than an increase of 15 or 20 per cent. secured by means of new consumers. We have gone over our books and calculated about what our increased revenue for the ensuing year will probably be, due to the natural growth of the city, and to the efforts and expenditures that we have thus far made in our new business department. We are going to reserve that increase to ourselves, and then we shall pay our representatives all that they shall make this year over and above that increase. We are virtually going to fine or penalize them for every range they put in, and for every new consumer they get requiring a new service pipe; but we are going to pay them liberally for every bit of additional business they get from existing consumers.

Mr. Perkins—Something has been said about renting arc lights, and that it was not a profitable thing for gas companies to do. My experience with gas arc lights is, if you sell an arc light, the consumer, through fancied economy, does not change the mantle at the proper time, or they are put in wrong, and the result is the light is thrown out and an electric light put in. I think it is best to rent them, and if you will supply new mantles, keep the lights clean, properly adjusted, and in first-class shape, you have a constant consumer all the time. We do not find it any trouble whatever to renew the leases, but where we have sold outright we have lost nearly 60 per cent. The people we rent lights to are still using them. Where they are put into the house of an existing consumer, we have substituted four lights where possibly he had two.

On motion of Mr. Gimper a vote of thanks was tendered Mr. Perkins for his paper.

(To be Continued)

[Prepared for the JOURNAL]

Artistic Candles and Candlesticks of the Far East.

By AN EXILE.

How they are Designed and Made.—The writer has taken special interest in the artistic types of wax, tallow and other forms of candles and sticks manufactured in the Far East, and herewith hands you an illustrated description of the same for the consideration of your readers. For many years the inhabitants of Japan, China, Sandwich Islands, Ladrone Islands, Gilbert Islands, Tahiti, the Philippines and Borneo have been turning out products in the line of candles of a very artistic character. All of these places mentioned have been visited by your correspondent during the past three years, and the data in this article is the result of the information in the artistic candle manufacturing line collected at the different points during this time. We will first refer to the plain candle. Some of these candles are manufactured almost on the same lines of procedure as in America. The Japanese follow the American custom of candle making very closely. They use molds and presses. The substances employed in the making of the candles include fats from animals, oils from vegetation, and pretty much the complete list of greases as in American centers. This applies to all of the countries and islands visited by the writer and named above. Although Japan makes many candles and exports large quantities to the other markets in the Far East, every one of the countries have their respective candle making establishments. I found candle makers in the remote sections of all of the South Sea islands.

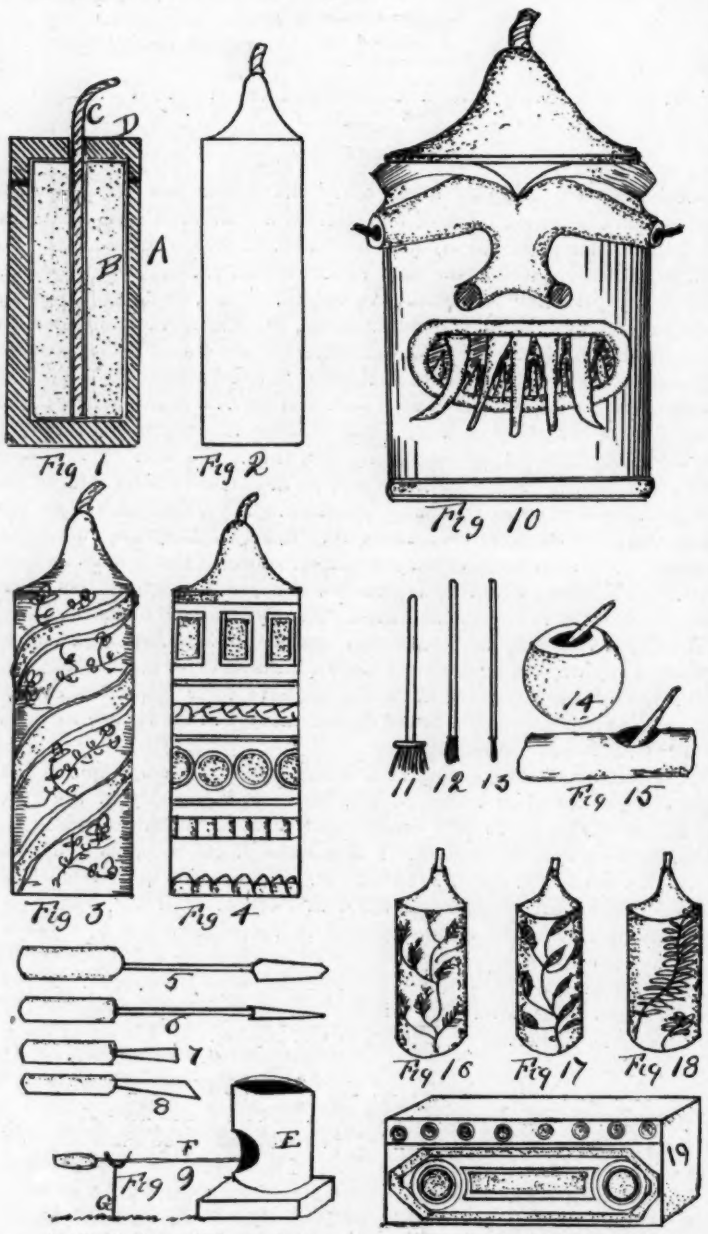
Processes of Molding.—In places where molds are employed in the producing of the plain finish candle, the mold is usually of the type presented in Fig. 1. It is a metal mold in some instances, while in others a wood cylinder is used. I saw some of these molds in Japan made of a hardened, clay-like substance. The bamboo quill is used in the Philippines and sheet metal tubes in Borneo. The tube portion is indicated at *A*, and the wick is placed in the center, as at *C*, while a hole made at *D* lets the melted fatty matter pass through to the center, *B*. After hardening the tube is opened and the candle removed. Fig. 2 shows one of the candles after it is finished off at the top. Some of the more modern molds are so made that the tapered top is cast at same time.

Decorating.—The natives of all the countries of the Far East are very fond of so-called decorated candles. Usually the decorations are produced by cutting figures or floral presentations upon the surface of the candle, as shown in Fig. 3. Again I have seen the figure work colored on with colored paints, manufactured from the native mineral and vegetable substances. Reds, yellows and blues predominate in these samples of hued work on candles. The figured candle sells at a

higher price and the richer classes of people are the principal buyers. The poor buy them only to use at wakes, or on other special occasions. Three or four modes are used for executing this design work on the surface of candle. One consists in the use of the knife, another using colors, and another of a peculiar nature involves the using of heated points of instruments. The process is described here. It consists, first, in the selection of a lot of tools, made very like the tools used by the plumber for soldering. In fact I saw some of the native decorators using soldering irons for this purpose as the iron holds the heat well. The special tools are represented in the next pictures, of which Fig. 5 is one made on the soldering iron idea. The point is heated in a fire, and this hot point is scrolled or traced over the surface of the smooth, glossy wax or tallow candle, and a design produced. In Fig. 4 is shown a sketching made by the writer from a candle frescoed in this fashion. All of the effects are produced by the tracing on the surface with hot pointed irons, the design as shown. In Fig. 6 is seen one of the pointed devices used for very fine line work. The point can be quickly drawn over the surface of the candle and the fine line produced. A blunter tool is needed for graining effects, and one is shown in Fig. 7. Sometimes it is necessary to have an angle shaped tool, like that in Fig. 8, for bringing out the desired effects in designs. The tool point is heated like the others and drawn over the surface of the candle and the required effect produced.

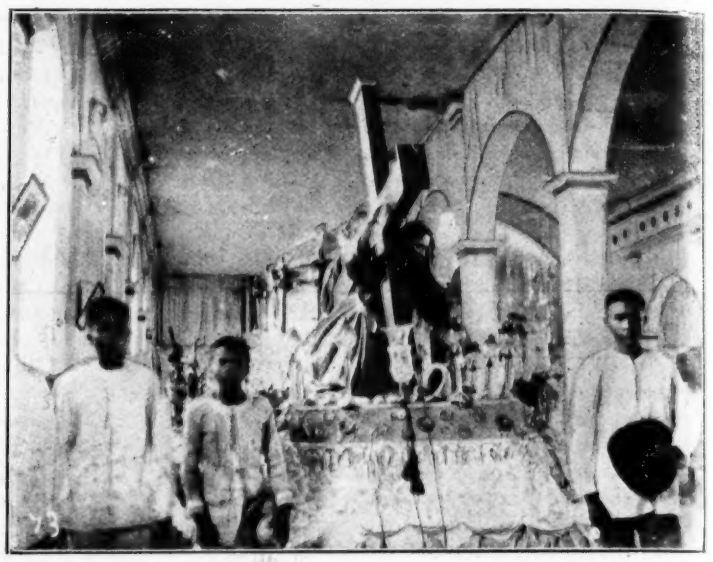
The Heating Device.—The heating device is next shown in Fig. 9, and consists of a plain, circular affair, made of pottery clay stuff. This is marked *E*. There is a door cut in the front into which the tools for heating are placed. The charcoal fire is made inside this device. A stand at *G* supports the tool in process of heating. The tool is indicated at *F*.

Some Odd Designs.—We will next call the reader's attention to some



Candle Making and Figuring in the Far East.

Designs for Candles in Far Eastern Countries.



Interior of Philipino Church, Where Many Fancy Designed Candles are Burned Every Year.

of the singular patterns of lighting devices employed in the far eastern countries. I saw in Japan some of the most artistic of lights, while the inhabitants of Borneo, Sumatra, Philippines and the Gilbert Islands are not very far behind. It may seem strange that apparently savage countries should undertake to work out these intricate designs in lighting apparatus, but the designers of this line of wares in these countries are just the persons to cater along this line. The type of intricately designed light apparatus which would please the native idea would not at all suit in the more civilized countries; hence the lamp designer is merely working along the lines of the trade in his own section. The figure in No. 10 is made of sheet metal, with protruding eyes and a row of fangs as shown. The latter are sometimes made by using the white teeth of animals. The light shines between the teeth and the effect is weird.

As to Color Work.—Japan lamp and light designers are probably further ahead in tinting these devices of any of the nations of the Far East. The Japanese possess better facilities for doing the work. Some of them have nearly as good brushes and devices as the decorators in America, and other advanced countries. On the other hand, the native designers of some of the other countries possess only crude appliances. In Fig. 11 is shown one of the homemade brushes of the native designer, and in 12 and 13 are some of the same pattern, only smaller. One of the mixing pots of Borneo is shown in Fig. 14. It is a crude stone vessel with stirring tool made of wood or stone. Sometimes these natives use a log in which a hollow is made, as in Fig. 15, and the mixing of the shades is effected in this. Concerning the applications of the colors and figures, these are accomplished according to the various ideas of the respective designers. Often the candles are decorated freely as represented in the next views. Fig. 16 shows one of the candles patterned with vine work, and in Fig. 17 is shown one of a similar nature. These decorated candles sell at greatly advanced prices, and the color artists earn rich rewards, providing they have any talent for original design and color application.

In Fig. 18 is shown another candle of free design work. Sometimes these patterns are cut into the candle with a sharp pointed tool. More frequently the coloring employed for this is more pleasing to the native trade. In Fig. 19 we have a sketching of one of the native boxes of Borneo used for containing the household lighting apparatus. Only the rich have these cases as a rule. Inside the case are cans of oil, candles and fixings of all descriptions connected with the employment of oils and waxes for lighting.

Some Educational Points.

By H. S. Knowlton, in *Elec. World.*

The rise of the technical graduate in the business world and the remarkable increase in his responsibilities which has manifested itself in the last decade are among the most interesting developments of the period. Considering the results of the training offered by the engineering schools, one is led to believe that much additional progress may be made in bringing the college world and active professional life into closer relationship than now obtains.

There can be no doubt that both professional school and business life occupy spheres of activity which are peculiarly their own, and nothing is farther from the intentions of the writer than to decry that thorough

groundwork of essential theory which should constitute the basis of every engineer's training. It is certain, however, that the usual four years' course of the technical school or college can in many instances be made of more lasting practical value, even at the cost of eliminating certain antiquated methods of instruction.

One of the most common obstacles to the attainment of a maximum educational efficiency is the exclusive absorption of the instructing staff in their own individually chosen special fields of labor. The importance of emphasizing the relations of the component parts of the curriculum is too often lost to sight, in the anxiety of the instructor lest he fail to secure a maximum amount of work from the student in some particular study, which is the former's hobby. Thus, in the mathematical courses, we believe that the principles of that beautiful science can be quite as well illustrated by examples drawn from engineering practice as by fossilized problems in regard to the distance an intelligent horse will walk in unwinding a taut rope from a hitching post, or the ultimate destination of a theoretical fox pursued by a pack of hounds in full cry over a parabolic path. In the electrical course, for instance, there is ample room for the exercise of mathematical ability in the prospective development of the equation of the railway motor curve, and the problems of the determination of the area of engine indicator cards are quite as likely to appeal to the interest of the proper minded embryonic mechanical engineer as the probability of drawing two red balls out of a possible five from a green bag in a theoretical raffle.

As far as possible, illustrations of principles studied in the various subjects taken up should be drawn from modern engineering and business as actually carried on in daily life. In mechanics, the railroad of to-day furnishes an almost inexhaustible supply of interesting and live problems. The tractive power of locomotives, train resistance, strength of bridges, carrying capacities of cars, relations between speeds, roadbed and track, consumption of fuel and intricacies of interlocking plants are but suggestions of the fascinating mechanical questions which compel the enthusiasm of the interested student. Similarly the electrical engineer student who has not mistaken his calling can be roused to a high pitch of working energy by giving him problems based upon the practice of neighboring electric railways, power transmission, lighting, telephone and telegraph interests.

The importance of frequent visits to industrial plants in the vicinity of the professional school cannot readily be overstated. As practice in training observation and bringing the students in touch with applied theory it ranks high in method. Even if the cost of such visits be the lessening of laboratory and machine shop practice by a few hours each fortnight, it is well worth while to make the trips, and the special processes and appliances noted should frequently form the subjects of future discussions in the classes instead of, as is often the case, being allowed to pass before the student's eye like a rapid panorama.

Lectures by prominent business and professional men afford excellent opportunity for students to come in contact with the essence of expert practical experience and advice. It is difficult to compress into a single sentence the broadening personal influence which the presence of a distinguished practicing specialist upon a professional school lecture platform imparts, but it is safe to say that no feature of the student's technical training is more powerful in promoting liberal mindedness. Hours spent with leaders in the professions are high privileges, and remain fixed in influence as the years go by. To neglect opportunities in this direction is to make a serious mistake, and to run in danger of intellectual narrowness of the most provincial degree.

Economics for engineering students can be made a thoroughly interesting and profitable study if the industrial life of the present day be turned to account. Questions of organization, finance, statistics, labor and management can be analyzed at practically first hand in these days of accessible information. Many a technical graduate does not know the difference between a contract and a requisition when he receives his degree, and cannot distinguish between a share of preferred stock and a bond. With enormous aggregations of capital like the United States Steel Corporation and the Atlantic ship combine to study, and with financial documents like the Pennsylvania Railroad's Annual Report to analyze, it is difficult to realize how the applications of economics in modern business can fail to add interest and progressive ideas to the briefest course in industrial science. The present stormy scenes between labor and capital, the controlling of markets, fluctuations in prices of securities, governmental suits against "holding corporations," and the widespread applications of insurance, open up an inexpressibly broad field of reading, which bears directly upon the occupation of the would-be engineer.

Finally, one cannot but urge the ever increasing advantage of making the utmost possible use of the professional journals. Discussions in class of their contents has been found most helpful by those who have tried it, and the satisfaction of keeping in touch with installations and methods of latest value, is great. Through the medium of the technical press many interesting and important tests, discoveries, and laboratory experiences can be made available for the world's use, with advantages to every participant in the bringing to light of new combinations of mind and matter, and in the same manner the academic atmosphere of the technical school can be freshened and invigorated by the contact with the commercial world which the technical journal brings about through its editorials, descriptions of progressive installations and general news. The experiences of both business, world and educational life can thus be interchanged, to their mutual advantage.

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

THE contract for furnishing seven 140,000 pound smelting blowers for the Cerro de Pasco (Peru) Mining Company, has been awarded to the P. H. & F. M. Roots Company, of Connersville, Ind., the home offices of which are in 120 Liberty street, this city. If we mistake not the contract named is the largest single order ever awarded for smelting blowers or any other sort of pressure blowers.

MR. W. C. PAULLINS has resigned the post of Superintendent to the Colorado Springs (Col.) Light and Power Company, in order to take a like place with the Pueblo (Col.) Gas and Fuel Company.

MR. IRA A. MILLER will succeed Mr. Paullins as the works man at Colorado Springs.

MR. L. C. GRAHAM, writing from Philadelphia under date of the 6th inst., says:

To the Editors AMERICAN GAS LIGHT JOURNAL: As we have had such uniformly good success in making cement joints on cast iron pipes, Mr. Bullock's article, in your issue of May 25th, was a surprise to me. I did not think that the proper making of cement joints was so little understood by any resident of any part of the country. I have been present at the making of thousands of cement joints, on all sizes of cast iron pipe, from 3 inches to 30 inches diameter, and we have experienced no trouble whatever in making them to withstand a pressure of 6 inches of mercury and remain tight afterwards, in any of the sizes less than 30 inches. In the latter size we were troubled in getting the joints tight, which difficulty I think was chiefly due to the weight of the pipe causing a slight settlement after the joint was made and before the jointing material was entirely set. We think we have learned to control the temperature so that cement joints can be made in the hottest weather and also to largely control the setting of the pipe; for we have had within the last 3 weeks put in over 300 feet of 30-inch pipe, which, on the 6-inch mercury test caused us to cut out only 7 joints. We find the cost of labor in making cement joints very much less than that charged when using lead. After the first yarn is put in and driven back, we make ten 30-inch joints per hour with 3 men packing the cement into the joint, 4 men (two to a joint), 1 man mixing cement, 1 man passing the cement to the packers, and 2 men facing, making the cost 22½ cents per joint at the pric s paid for such sorts of labor here. I have not the time at present to go into the details of making cement joints, but if there are those contemplating using cement for such work who may have been frightened off by Mr. Bullock's article, I will gladly supply them with any information on the subject in my possession.

RESPECTING the matter of lead versus cement joints, Mr. Bullock has the following further to say—his letter is dated from Morristown, N. J., June 8th:

To the Editors AMERICAN GAS LIGHT JOURNAL: As Mr. Walton Forstall virtually charges me, in your issue of even date, with ignorance concerning cement joints (as per my communication thereon in the JOURNAL for May 25th), I am sure you will permit me a few words in reply. My knowledge of main laying was obtained under the tutelage of experienced instructors and by means of personal, actual work in the ditches, followed in due time by having charge of others doing similar work. Consequently, it was of a practical nature, not gained from desk work study or technical institute educational training. Not that in this I mean those more fortunately situated should not thank the point of opportunity or of happening, nor that those so fortunately placed may have been sufficiently capable of judging without the priority of actual

ditch work. One of the pleas put out in favor of the making of cement joints that I have heard is that less skill was required in their making. That the reverse is the case, as Mr. Forstall stated, is certainly news to me. He deserves credit for pointing out that feature of his experience, though it is quite contrary to mine, and possibly to that of some other men, who might add interest to this matter if they kindly would speak in elucidation of this question for the good of all. As to the suggestion made by Mr. Forstall that "It is much safer to tamp around the pipes between the bells before making the joints than after making"—that feature of the work is, of course, "As old as the hills."

THE Coast Gas Company is now supplying gas to Belmar, N. J. The Company will be represented at Bradley Beach by Mr. Richard Kelly, and Mr. John Fritz will represent it at Spring Lake.

THE Chuctanunda Gas Light Company, of Amsterdam, N. Y., has doubled its capital stock. The increase is to be devoted to enlarging the service of the Company. The Messrs. Sanford seem to be working along swift lines respecting their gas property, and it is vastly a more profitable bit of ownership than the fastest horse they ever owned.

AT the annual meeting of the Binghamton (N. Y.) Gas Works Company the officers elected were: Directors, J. M. Stevens, Emerson McMillin, J. W. Manier, W. G. Phelps, Geo. W. Dunn, Chas. M. Stone, S. J. Hirschman, C. G. Jackson and Geo. F. O'Neill; President, Emerson McMcMillin; Vice-Presidents, J. W. Manier and J. W. Stevens; Treasurer, J. W. Manier; Secretary, W. B. Mahoney; General Manager and Assistant Secretary, Fred. B. Wheeler.

THE offices of the Goshen (Ind.) Gas Company have been removed to suitable quarters in the Masonic Block.

MR. JAY BURNS has been authorized by the authorities of Laramie City, Wyoming, to construct and operate a gas works in the place named. He is to proceed with construction work forthwith and agrees to have the plant completed within 6 months. The authorities have promised to take a certain number of lights for use on public account, the annual total cost of which is not to exceed $3,720.

MR. WM. T. MORRIS and associates have made a bid for the properties of the Greenville (O.) Gas Company.

THE Kephart Light and Gas Company, of Webster City, Ia., proposes to reconstruct its plant.

AT the annual meeting of the Mutual Gas Company, of Muncie, Ind., the Directors elected were: C. W. Throop, L. M. Coons, O. E. Baldwin, R. H. Cowan and P. P. Busch.

THE charter of the old St. Catharines and Welland Canal (Can.) Gas Light Company expires the 27th inst., and the St. Catharines Gas Company is being formed to take over the assets of the existing Company and to continue its business.

AT a recent meeting of the Board of Directors of the Key City Gas Company, of Dubuque, Ia., Mr. George McLean was elected President to succeed the late Mr. William L. Bradley, and Mr. William L. Bradley, Jr., was elected Secretary. The executive organization of the Company now stands as follows: President, Mr. George McLean: Vice-President, Mr. B. W. Lacy; Secretary, Mr. William L. Bradley; Treasurer, Mr. J. K. Deming; Directors, Messrs. Thos. Connolly, W. H. Day, B. W. Lacy, George McLean, D. D. Myers, Jacob Rich and Jno. V. Rider.

MR. W. R. KEFFER, Secretary of the Capital City Gas Company, of Des Moines, Ia., has returned home from a trip that covered more than a year, greatly improved in health.

THE Schuylkill Valley (Pa.) Gas Company is extending its mains to the outlying district of Port Carbon.

LAKE CHARLES, La., wants a gas works. Mr. George L. Roberts, of Port Huron, Mich., says that a Michigan syndicate which he represents will furnish the required plant, if the franchise conditions are favorable.

A CORRESPONDENT in Baltimore forwards the following: "A project tending toward the erection of a gas plant to supply Highlandtown, Canton and Orangeville, suburbs of Baltimore, with gas for lighting, heating and commercial purposes is being contemplated. Mr. Joseph Schrieber, formerly General Manager of the Baltimore County Water and Electric Company, is mentioned as the promoter of the new enterprise. A few days ago Mr. Schrieber applied to the Board of County Commissioners for a franchise granting the right to lay and maintain gas pipes and mains, with such connections as may be required, for the purpose of furnishing gas for public, as well as private, lighting, heating and other purposes on streets, avenues and alleys in Highlandtown, Canton and Orangeville. Mr. Schrieber wants the franchise for a period of 25 years. Arguments for or against the granting of the franchise will be received at the Commissioners' office, at Towson, for the next three weeks, beginning to-day. It is expected that considerable controversy over the granting of the privilege will arise, as the laws governing the right of way of the Consolidated Gas Company, which now supplies with gas a large part of the territory mentioned by the new concern, prohibit any other gas company from operating in that section. Mr. Schrieber, however, has gone over the situation carefully and expects to overcome any objections to his project which may develop. The new plant will probably be located in Highlandtown."

THE following is from the Indianapolis (Ind.) *News* of recent date: The Indianapolis Gas Company is preparing to offer the 5,000 patrons who will be cut off from natural gas on Monday artificial gas for cooking purposes by connecting gas ranges with the artificial pipes already in service. John R. Pearson, Vice-President of the Company, said to-day (the 5th inst.) that the Company's artificial mains extend to nearly all parts of the city where customers are now receiving natural gas, and the Company can easily make connections with houses for the artificial service. The artificial service may in the near future be extended to West Indianapolis, North Indianapolis, Brightwood, Irvington and other places where there are no artificial pipe lines, by sending the gas through the natural gas mains which are to be abandoned in those parts of the city. Mr. Pearson is not ready to make any announcement on this latter point, however, and will not do so until after the Directors of the Company have met to determine what shall be done with the mains that will be thrown out of use by the cutting off of the natural gas. Mr. Pearson expects to hear from President Hastings, at Philadelphia, within a short time, and will then probably be able to tell more about the Company's plans. Mr. Pearson declared, however, that it will be an easy matter to turn the artificial gas into these outlying mains and to make arrangements to supply patrons who want to use the artificial gas for cooking purposes. The Company will make no effort, however, to supply artificial gas for heating purposes, as Mr. Pearson says it has been conclusively proved by costly experiments that this cannot be done. The natural gas is now only being supplied for the most part to people living near the high pressure mains. Most of the houses in these neighborhoods are fitted up for artificial gas. People who want to put in artificial gas ranges can easily connect the stoves with the artificial pipes already in the house. Artificial ranges for cooking purposes can be used at small cost. In the last two years one firm has installed 1,500 ranges in the city, principally in the new apartment houses, and experiments show that the maximum cost of such ranges is about $1.50 a month. Hardware dealers generally are anticipating a great rush for the artificial ranges, and many of them have placed large orders with wholesale houses and manufacturers since the decision of Judge Neal in the gas case, dissolving the temporary injunction and giving the Gas Company the right to discontinue the natural gas. Mr. Pearson likewise declared that the cost of artificial gas for cooking purposes is nominal. "Our bills show that the ranges can be operated for from 40 cents to $2 a month, according to whether the stoves are kept in operation all the time or only at the times when meals are being prepared," said he. A conference was arranged for this afternoon between Mayor Bookwalter and City Attorney Joss to determine what course the city shall pursue in the gas case under the ruling of Judge Neal. At this meeting it may be decided to appeal the case, but from the manner in which the city officials talk it appears that they do not have much hope of accomplishing anything against the Company. Mayor Bookwalter said: "Whatever can be done to compel the Gas Company to live up to its contract will done by the city. I have never been able to see why a contract between a private corporation and a municipal corporation is not as binding as any other contract. The court at Noblesville has ruled otherwise, however. We will canvas the matter to-day to come to a decision as to what can be done." City Attorney Joss declared that he has not determined what course will be best to pursue. He did not wish to talk about the case until after his conference with the Mayor. The decision of the court to the effect that even if it should force the Company to maintain the contract the actual enforcement would be but a farce, owing to the great decrease in the gas supply is disheartening to the city attorney. An appeal can be taken to the Supreme Court, but the Company could cut off the gas in the meantime. It is pointed out that as it would be several months at best before a decision could be reached in the higher court, it is probable the gas supply would be so low that there would be little gain to the people even if the court should decide in favor of the city. The fact that the people showed very little interest at the time the suit was filed has also made the city officials believe that not many citizens care whether the gas is shut off or not. The city advertised before the injunction proceedings were started, asking all citizens who were interested in the suit to send in their names, but responses were received from only about 250 gas patrons."

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NOTIFICATION RESPECTING ADVERTISING.

Orders for new advertising, or for changes in standing advertisements, to insure attention in the issue following their reception, must be in hand any time of Wednesday.

AGENTS:

New York—American News Co. 39 and 41 Chambers St.
Germany—Lemcke & Buechner, of New York.
England—Aug. Siegle, 30 Lime Street, London.

MONDAY, JUNE 15, 1903.

The Market for Gas Securities.

Early this week, in fact well into the week, operators for the short account had things all their own way; but yesterday (Thursday) their efforts were not quite to their liking. Consolidated having sold below 190 on Tuesday, to-day finds it at 198¼. Brooklyn Union, that earlier in the week sold at 201, sold to-day at 214½; and if the whole truth were told there was no real cause why either should have sold at the low prices named, whereas there are twenty reasons why both should be selling at prices full 50 points above those of the closing to-day (Friday.) Buy them both; that is our advice.

Out-of-town gas shares participated in the upward movement, Peoples, of Chicago, making a gain from the low point of 5 points. This stock is easily worth 115. Cincinnati (O.) Gas and Electric remains firm. The books close the 15th inst., for the payment of the July dividend, to remain closed until the 21st inst., as the new stock being issued does not participate in the July disbursement. Consolidated, of Baltimore, is quoted at 67 to 67½, and Washington (D. C.) is being freely traded in at 415 to 425.

The United Gas Improvement Company has declared its regular quarterly dividend of 2 per cent.

American Light and Traction common is 78 to 80.

Gas Stocks.

Quotations by George W. Close, Broker and Dealer in Gas Stocks.

16 WALL STREET, NEW YORK CITY.

JUNE 15.

☞All communications will receive particular attention.

☞The following quotations are based on the par value of $100 per share.

N. Y. City Companies.	*Capital.*	*Par.*	*Bid.*	*Asked.*
Consolidated	$73,177,000	100	197	198
Central Union, Bonds, 5's.	3,000,000	1,000	109	111
Equitable Bonds, 6's	1,000,000	1,000	105	..
" 1st Con. 5's	2,300,000	1,000	118	120
Metropolitan Bonds	658,000	..	108	112
Mutual	3,500,000	100	300	310
Municipal Bonds	750,000	..	..	
New Amsterdam Gas Co.. Bonds, 5's	11,000,000	1,000	108½	109
Northern Union, Bonds, 5's.	1,250,000	1,000	104	107
New York and East River Bonds 1st 5's	3,500,000	1,000	112	113
" 1st Con. 5's	1,500,000		109	111
Standard	5,000,000	100	131	..
Preferred	5,000,000	100	152½	..
Bonds, 1st Mortgage, 5's	1,500,000	1,000	115½	118
Yonkers	299,650	500	130	.
Out-of-Town Companies.				
Brooklyn Union	15,000,000	100	214	215
" " Bonds (5's)	15 000,000	1,000	119	119½
Bay State	50,000,000	50	⅛	¼
" Income Bonds	2,000,000	1,000	..	75
Binghamton Gas Works...	450,000	100	28	30
" 1st Mtg. 5's	509,000	1,000	93	96
Boston United Gas Co.— 1st Series S. F. Trust	7,000,000	1,000	82	85
2d " " "	3,000,000	1,000	47½	50
Buffalo City Gas Co.	5,500,000	100	7	10
" " Bonds, 5's	5,250,000	1,000	73	76
Capital, Sacramento	500,000	50	..	35
Bonds (6's)	150,000	1,000	..	..
Central, San Francisco	1,900,000	..	106	108
Chicago Gas Co. Guaranteed Gold Bonds	7,650,000	1,000	104	104½
Cincinnati Gas & Elec. Co..	29,500,000	100	97½	98
Columbus (O.) Gas Co., 1st Mortgage Bonds	1,500,000	1,000	101	101½
Columbus (O.) Gas Lt. & Heating Co	1,682,750	100	88¾	89¼
Preferred	3,026,500	100	107½	109
Consumers Jersey City Bonds	600,000	1,000	100	102
Consumers, Toronto	1,700,000	50	218	225
Consolidated, Baltimore...	11,000,000	100	57	67¾
Mortgage, 6's	3,600,000	..	..	118
Chesapeake, 1st 6's	1,000,000	..	..	..
Equitable, 1st 6's	910,000	..	..	..
Consolidated, 1st 5's...	1,490 000	..	..	112
Consolidated Gas Co. of N.J.	1,000,000	100	15	17
" Con. Mtg. 5's	880,000	1,000	85	87
Consolidated G. & E. Co.'s. Little Falls, N.Y.	90,000	100		100
Bonds	75,000	..	..	100
Detroit City Gas Co.	4,825,500	50	..	89
" Prior Lien 5's	5,608,000	1,000	99½	100
Detroit Gas Co., 5's	381,000	1,000	77	79
" Inc. 5's	16,000	100	98½	100
Equitable Gas & Fuel Co., Chicago, Bonds	2,000,000	1,000	..	101
Essex and Hudson Gas Co.	6,500,000	..	39	40
Fort Wayne	2,000,000	..	..	..
" Bonds	2,000,000	..	55	..
Grand Rapids Gas Lt. Co. 1st Mtg. 5's	1,925,000	1,000	104½	105
Hartford	750,000	25	245	265
Hudson County Gas Co., of New Jersey	10,500,000	..	25	..
" Bonds, 5's	10,500,000	..	101	103
Indianapolis	2,000,000	..	70	80
" Bonds, 6's	2,650,000	..	102	104
Jackson Gas Co.	250,000	50	73	75
" 1st Mtg. 5's	290,000	1,000	101	102½
Kansas City Gas Light Co., of Missouri	5,000,000	100	..	36
Bonds, 1st 5's	3,822,000	1,000	102	104
Laclede, St. Louis	10,000,000	100	85	.
Preferred	2,500,000	100	93½	..
Bonds	10,000,000	1,000	109½	110
Lafayette Gas Co., Ind.	1,000,000	100		60
Bonds	1,000,000	1,000	60	65
Louisville	2,570,000	50	130	140
Madison Gas & Elec. Co. " 1st Mtg. 6's	350,000	1,000	107½	108½
" 6 per cent. scrip, due 1910	100,000	25	85	87
Montreal, Canada	2,000,000	100	218	184¾
Nashville Gas Lt. Co.	1,000,000	100	110	..
Newark, N. J., Con. Gas Co	6,000,000	..	56	58
Bonds, 6's	4,600,000	..	105	105¾
New Haven	1,000,000	25	300	325
Oakland, Cal.	2,000,000	..	46	47
" Bonds	750,000	..	..	.
Peoples G. L. & Coke Co., of Chicago	25,000,000	100	98	98¾
Peoples Gas Lt. & Coke Co., Chicago, 1st Mortgage	20,100,000	1,000	..	..
2d "	2,500,000	1,000	104	
Rochester Gas & Elec. Co..	2,150,000	50	88	..
Preferred	2,150,000	50	118	..
Consolidated 5's	2,000,000	.	87½	90
San Francisco, Cal.	10,000,000	100	51½	52
St. Joseph Gas Co. " 1st Mtg. 5's	751,000	1,000	95	98½
St. Paul Gas Light Co.	1,500,000	100	45	47
1st Mortgage 6's	650,000	1,000	113	116
Extension, 6's	600,000	1,000	112½	115
General Mortgage, 5's..	2,465,000	1,000	92	93
Syracuse, N. Y.	1,975,000	100	42	45
Bonds	2,047,000	1,000	93½	99½
Washington, D. C	2,500,000	20	417½	421
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DIVIDEND NOTICE.

OFFICE OF THE UNITED GAS IMPROVEMENT CO.,
N. W. CORNER BROAD AND ARCH STS.,
PHILADELPHIA, PA., June 8, 1903.

The Directors have this day declared a quarterly dividend of 2 per cent. (one dollar per share), payable July 15th, 1903, to stockholders of record at the close of business, June 30, 1903. Checks will be mailed.

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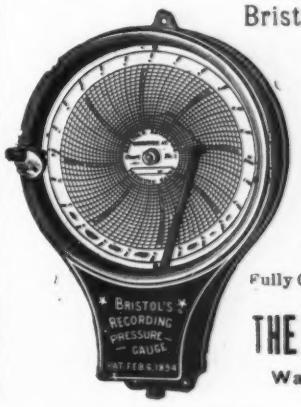

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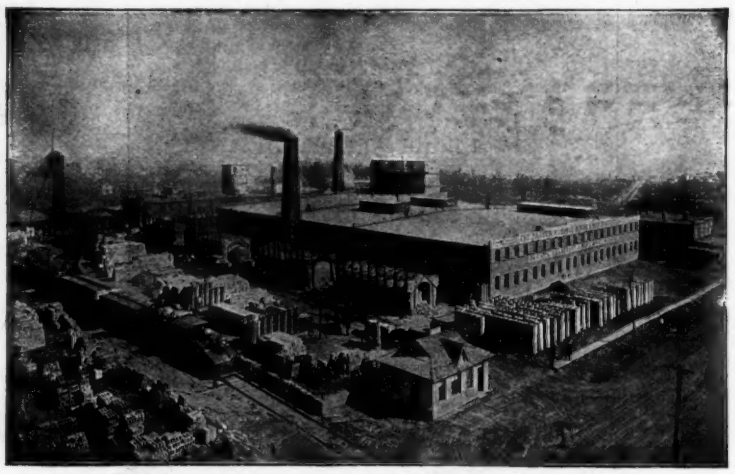

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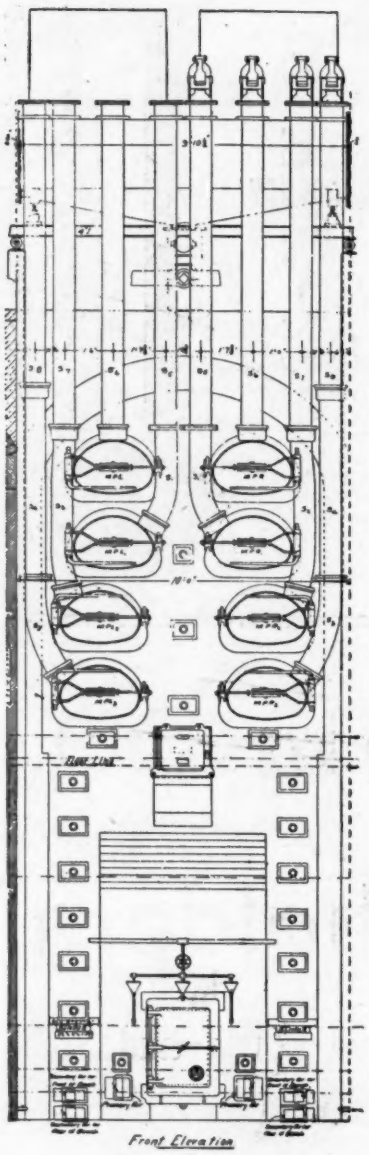

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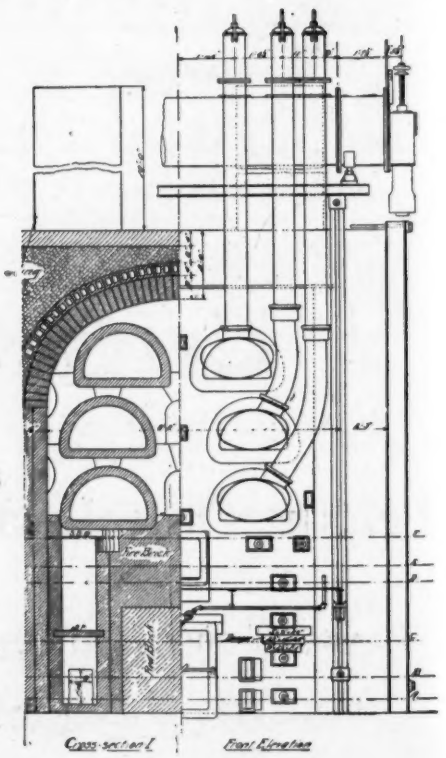

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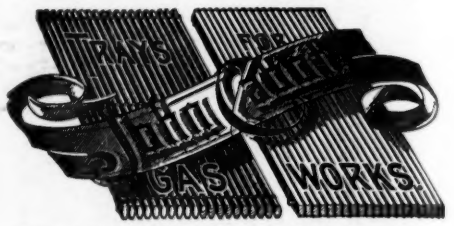

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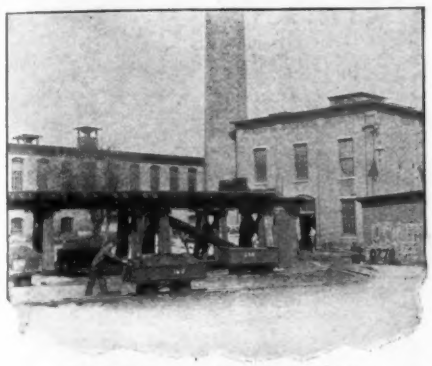

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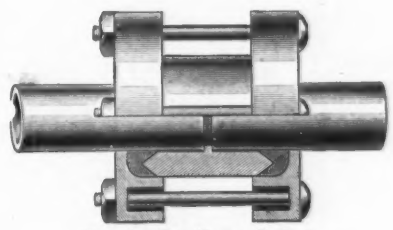
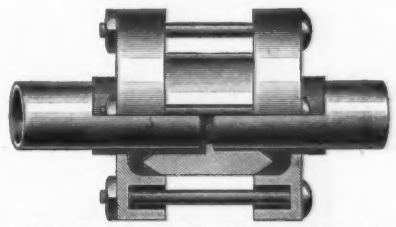
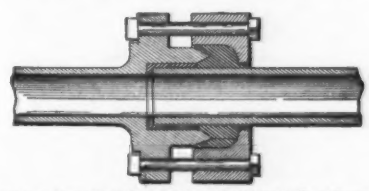


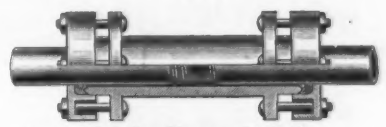
Regular Coupling. Style 1.



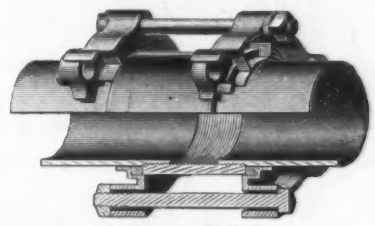
Insulating Coupling for Wrought Iron Pipe. Style 5.



Insulating Coupling for Bell and Spigot Cast Iron Pipe. Style 6.



Regular Sleeve. Style 2.



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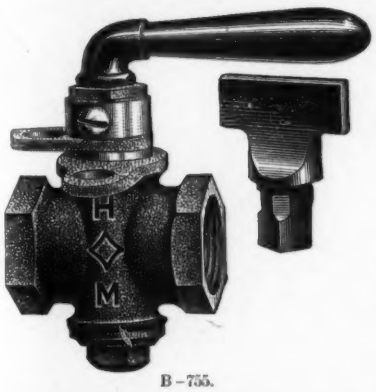

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In **Mueller Gas Cocks** you find a happy medium--not so little metal as to leave them weak, nor yet so much as to make them costly.

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H. MUELLER MFG. CO.,

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Double and Single Gate Valves, ¼" to 72",

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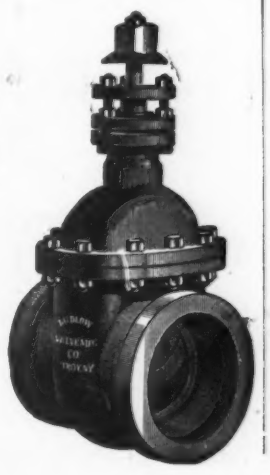

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Coal Gas Condensing and Scrubbing Apparatus.
Purifiers with Plain or Reversing Center Valves.
The Lloyd System of Valve Connections.
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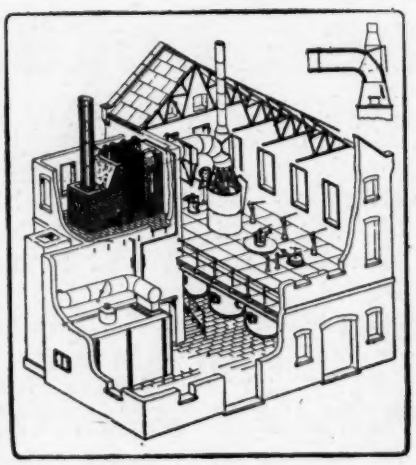
Economize Heat in Water Gas Plants,

BY UTILIZING A

Green's Economizer,



To absorb the heat now going to waste when you blow through your superheater to heat the feed water for your boilers to the temperature of the steam. This is now being done at the Poughkeepsie Gas Works, Poughkeepsie, N. Y. : : : : :

Write for full particulars how this is accomplished, the saving effected, and the advantages gained, to the

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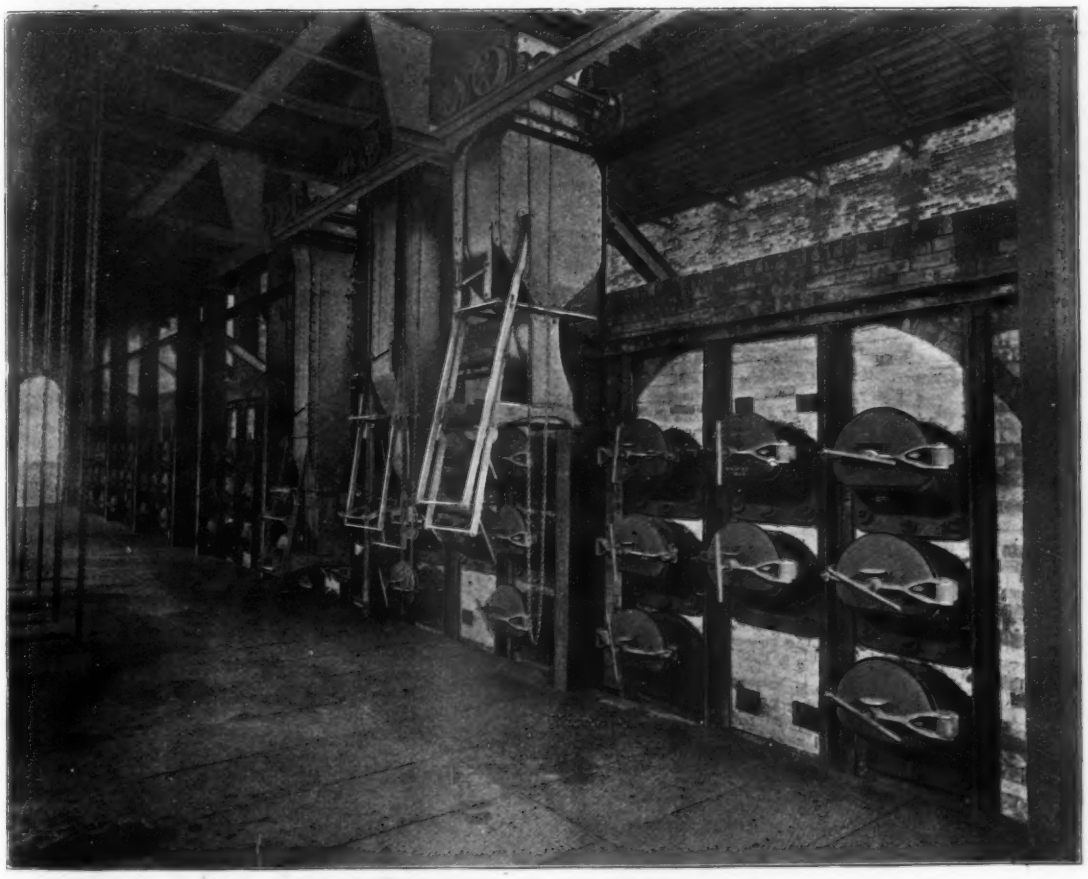

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Drilling and Tapping Pipe under Pressure

WITHOUT ANY ESCAPE OF GAS.

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Machines Sent to any Gas Company for Thirty Days' Trial.

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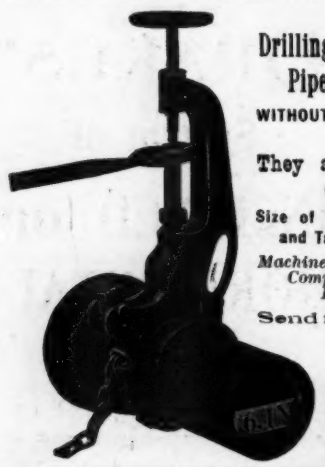

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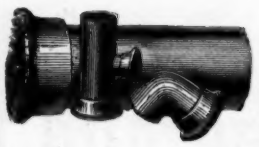

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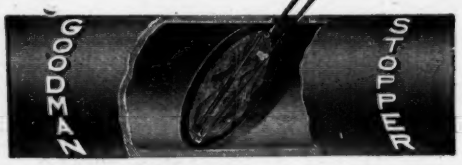
Any size gas main can be shut off in 30 seconds. : : :



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Humphrey Crescent Instantaneous Water Heater

IS A QUICK SELLER.

PRICE,

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HAS NO EQUAL AT THE PRICE.

TRY ONE AND BE CONVINCED. WILL SEND ON 60 DAYS' APPROVAL.

HAVE YOU OUR CATALOGUE?

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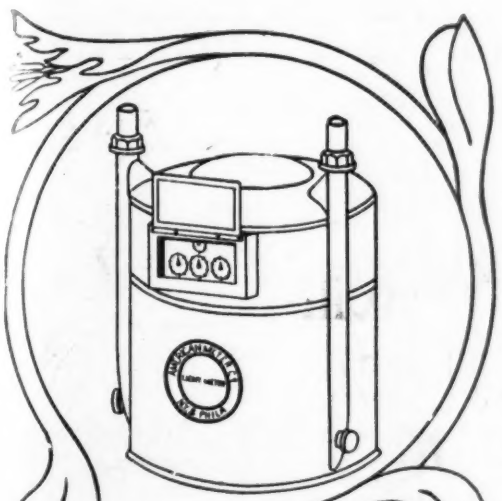
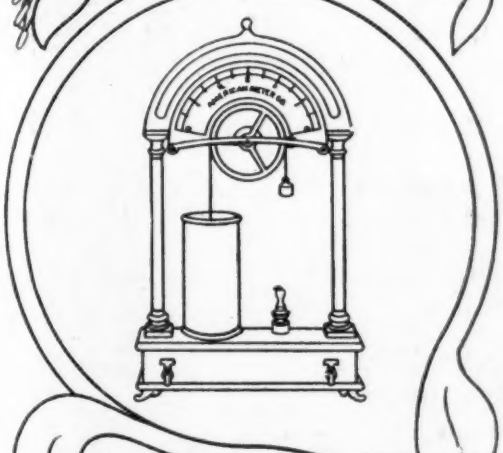
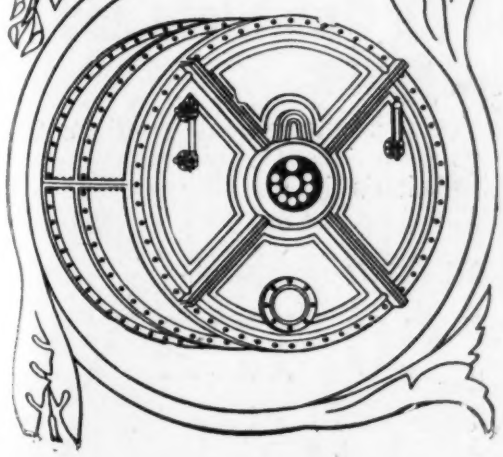






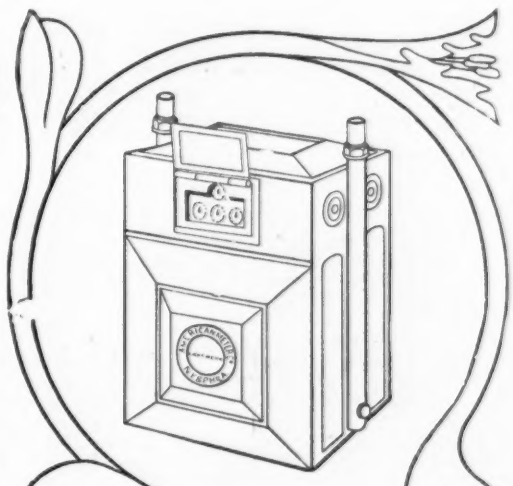
PUBLIC LIGHTING TABLE.

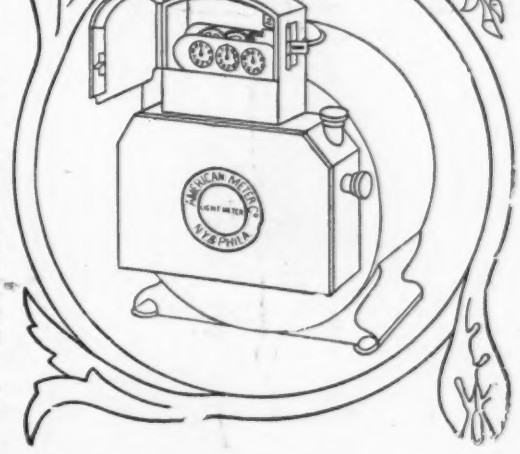
JULY, 1903.

Day of Week.	Date.	Table No. 1. Following the Moon. Light.	Table No. 1. Extinguish.	Table No. 2. New York City. All Night Lighting. Light.	Table No. 2. Extinguish.
				P.M.	A.M.
Wed.	1	10.50 PM FQ	3.30 AM	7.30	3.15
Thu.	2	11.30	3.30	7.30	3.15
Fri.	3	12.00	3.30	7.30	3.15
Sat.	4	12.40 AM	3.30	7.30	3.15
Sun.	5	1.20	3.40	7.30	3.15
Mon.	6	2.10	3.40	7.30	3.15
Tue.	7	2.50	3.40	7.30	3.15
Wed.	8	No L.	No L.	7.30	3.15
Thu.	9	No L. FM	No L.	7.30	3.15
Fri.	10	No L.	No L.	7.30	3.15
Sat.	11	8.00 PM	9.30 PM	7.30	3.15
Sun.	12	8.00	10.00	7.30	3.15
Mon.	13	8.00	10.30	7.30	3.15
Tue.	14	8.00	11.00	7.30	3.15
Wed.	15	8.00	11.30	7.30	3.15
Thu.	16	8.00	12.00	7.20	3.15
Fri.	17	8.00 LQ	12.40 AM	7.20	3.15
Sat.	18	8.00	1.20	7.20	3.15
Sun.	19	7.50	2.00	7.20	3.15
Mon.	20	7.50	2.50	7.20	3.15
Tue.	21	7.50	3.50	7.20	3.15
Wed.	22	7.50	3.50	7.20	3.15
Thu.	23	7.50	3.50	7.20	3.15
Fri.	24	7.50 NM	3.50	7.20	3.15
Sat.	25	7.50	3.50	7.20	3.15
Sun.	26	7.50	3.50	7.20	3.15
Mon.	27	7.50	3.50	7.20	3.15
Tue.	28	7.50	3.50	7.20	3.15
Wed.	29	9.30	3.50	7.20	3.15
Thu.	30	10.00 FQ	3.50	7.10	3.30
Fri.	31	10.40	3.50	7.10	3.30

TOTAL HOURS LIGHTING DURING 1903.

By Table No. 1.	Hrs. Min.	By Table No. 2.	Hrs. Min.
January	245.00	January	423.20
February	192.00	February	355.25
March	201.00	March	355.35
April	167.20	April	298.50
May	152.00	May	264.50
June	131.00	June	234.25
July	140.40	July	243.45
August	156.20	August	280.25
September	171.20	September	321.15
October	198.20	October	374.30
November	216.30	November	401.40
December	232.10	December	433.45
Total, yr.	2203.40	Total, yr.	3987.45

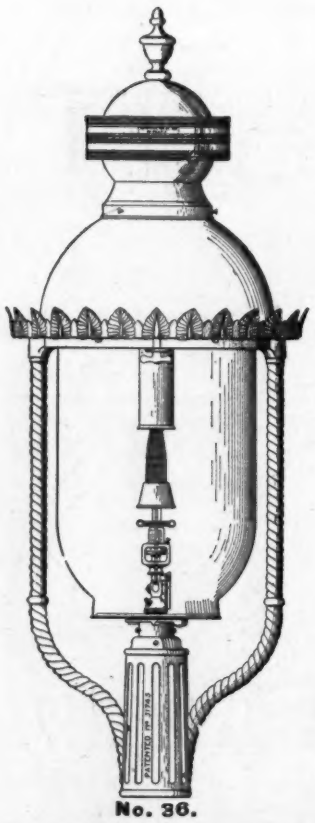




NEW YORK, 33 Nassau Street. PHILADELPHIA, Broad and Arch Streets. CHICAGO, Foot of Orleans Street. BOSTON, 624 Tremont Building.
CLEVELAND, 809 Cuyahoga Building. ST. LOUIS, 712 Roe Building. SAN FRANCISCO, 712 Polk Street.

WELSBACH STREET LIGHTING COMPANY

.... OF AMERICA ....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Controls and Operates the

Welsbach System of Street Lighting,

Which includes its specially DESIGNED AND PATENTED BURNER for STREET and PARK LIGHTING exclusively.

Uniformly SUCCESSFUL in 150 Cities and Towns.

By means of the Welsbach System of street lighting the superiority of GAS over electricity for street lighting has been fully demonstrated.

POINTS OF MERIT:

It is { Economical, Attractive, Successful, Up-to-date.

IT LIGHTS THE STREET.

Where there are no gas mains we can furnish an equally good light by our SELF-GENERATING NAPHTHA WELSBACH BURNER, and thereby supply a uniform light in all localities.

Correspondence Solicited from Gas Companies and Others Interested in Municipal and Outside Lighting.

No. 38.

The Welsbach Gas Arc for Indoor Lighting.

The cut tells the story—but not all of it. Get one lamp and light it—then the tale's told from beginning to end. For one Welsbach Gas Arc Lamp is a better salesman than 20 pages of advertising.

Here's what it would show if you give it a chance to prove its worth:

1. A mechanical construction and finish that insures the greatest durability.
2. The renewal of mantles and the cleaning of globes without removal of globe.
3. The greatest amount of candle power with least consumption of gas.
4. A by-pass cock so constructed as to permit all or only one mantle burning at a time.
5. A pilot light that consumes but 1 foot of gas in 24 hours. Costs $\frac{1}{10}$ of a cent a day.

Give it a Chance to Tell its Own Story and it Won't Disappoint.

Let us send you one lamp—doesn't cost a fortune—and it will answer every question you put to it; make good on every test given it. You know the only proof of the pudding? What's the use in a fellow telling you it tastes good? Taste it yourself, then you know.

May we Send you ONE Lamp?

WELSBACH COMPANY,

GLOUCESTER, N. J., and CHICAGO, ILL.

THE UNITED GAS IMPROVEMENT COMPANY

During the Year 1902 has been Awarded Contracts in the Following Places for

Standard Double-Superheater Lowe Water Gas Apparatus.

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Ardmore, Pa.	Hollidaysburg, Pa.	Norwalk, O.
Auburn, N. Y.	Houston, Tex.	Ocean City, N. J.
Belmar, N. J.	Indianapolis, Ind.	Oklahoma City, O. T.
Blue Island, Ills.	Jersey City, N. J.	Oneonta, N. Y.
Boonton, N. J.	Laconia, N. H.	Plainfield, N. J.
Brooklyn, N. Y.	Lakewood, N. J.	Portland, Me.
Carlisle, Pa.	La-Salle-Peru, Ills.	Pottsville, Pa.
Champaign, Ills.	Martinsville, Ind.	Scranton, Pa.
Coney Island, N. Y.	Memphis, Tenn.	South Brooklyn, N. Y.
Dallas, Tex.	Newark, N. J.	Suffern, N. Y.
Danville, Ills.	New Brunswick, N. J.	Swedesboro, N. J.
Des Moines, Ia.	New London, Conn.	Syracuse, N. Y.
Evanston, Ills.	New Orleans, La.	Washington, N. C.
Evansville, Ind.	Norfolk, Va.	Woonsocket, R. I.

TOTAL SETS, 1902, ... 51
TOTAL DAILY CAPACITY, 1902, . . 32,825,000 cubic feet.
TOTAL SETS TO DATE, ... 447
TOTAL DAILY CAPACITY, ... 299,670,000 cubic feet.

The United Gas Improvement Company,

Broad and Arch Streets, Philadelphia.

Established 1858. Incorporated 1890.
CHAS. E. GREGORY, Prest. DAVID R. DALY, V.-Prest. & Treas.
H. D. ABERNETHY, Sec.

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Greene & Essex Streets,
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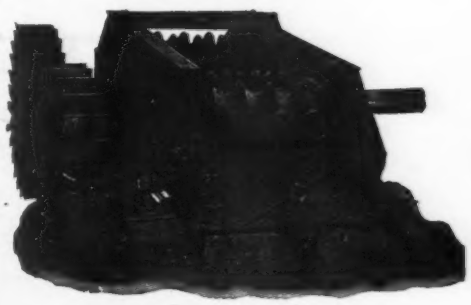

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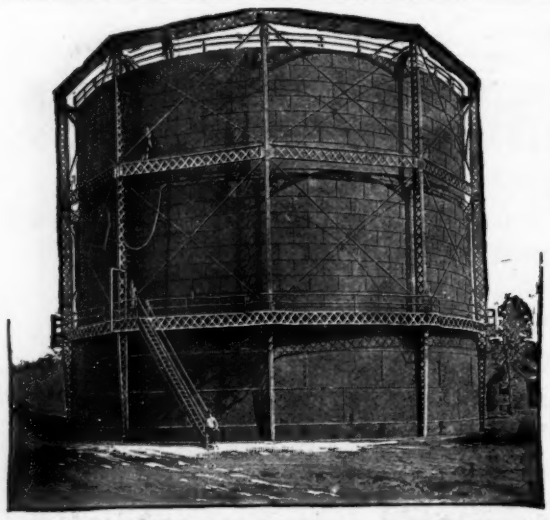

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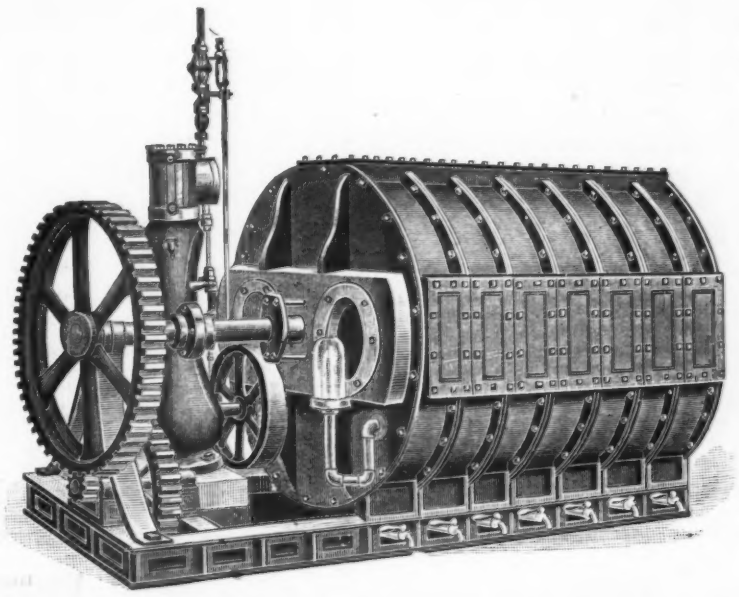

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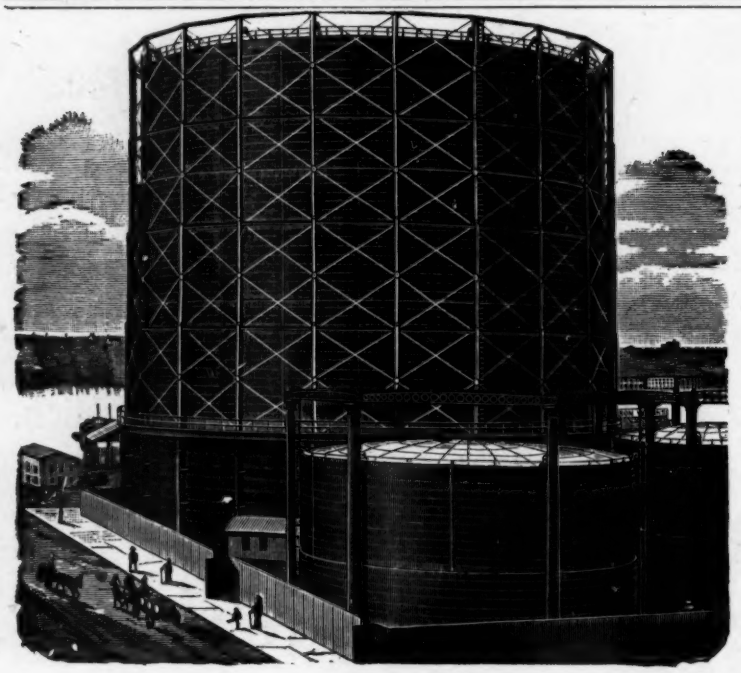

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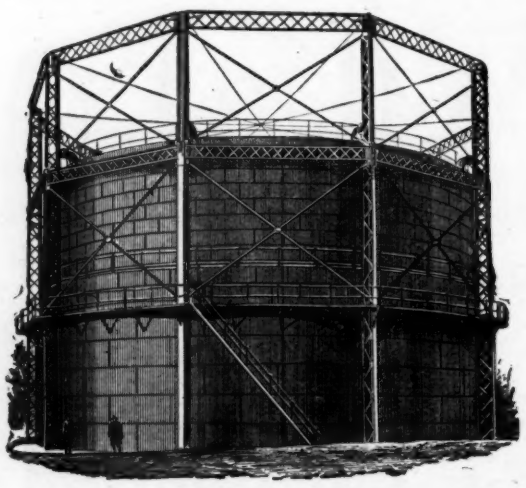

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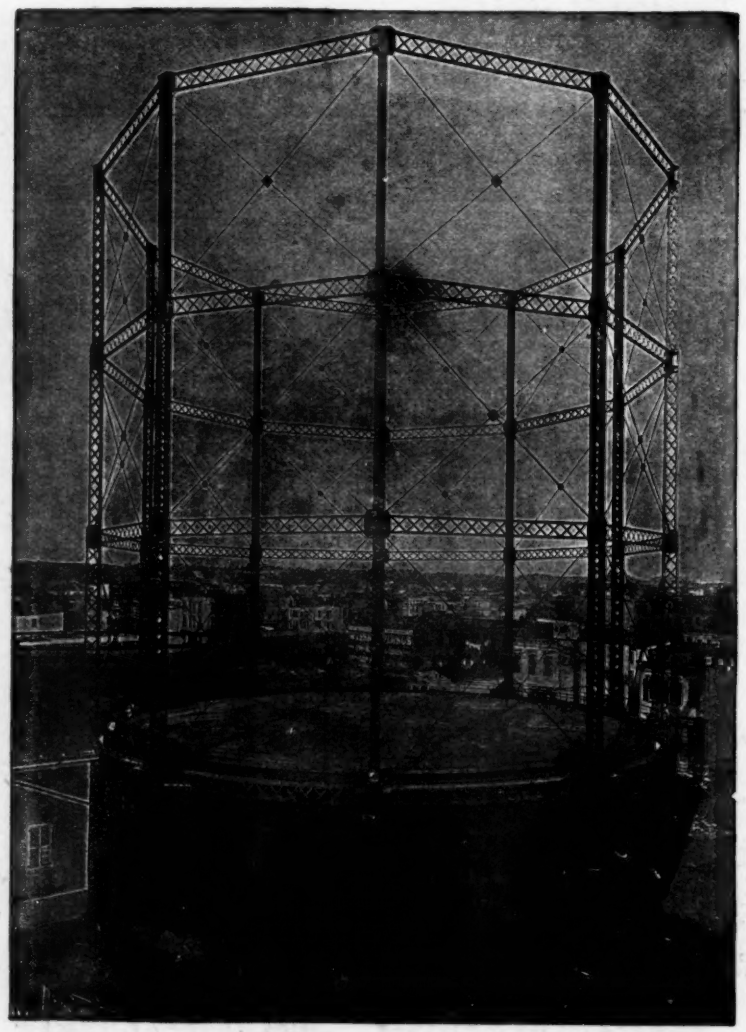

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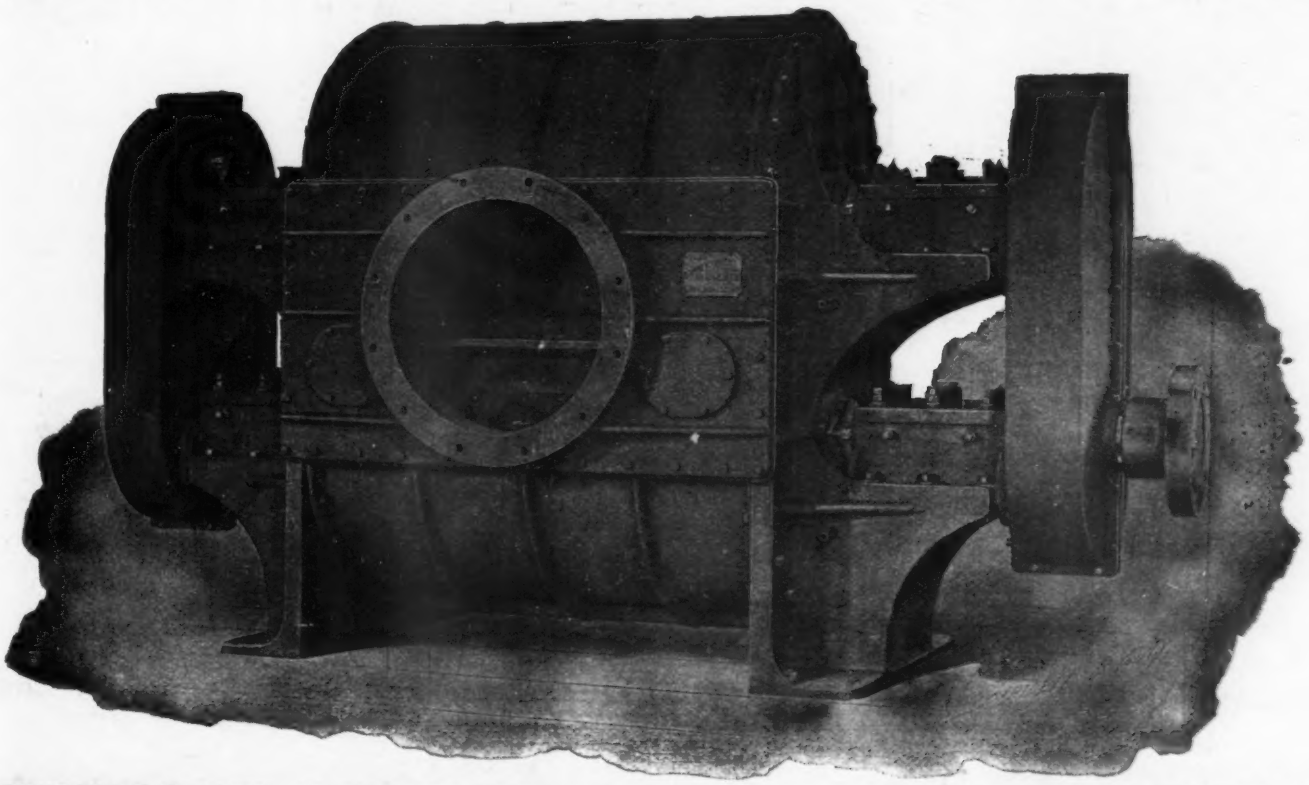

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